

A REVISION OF THE GENUS CRYPTUS FABRICIUS S. STR.  
IN THE WESTERN PALEARCTIC REGION, WITH KEYS TO  
GENERA OF CRYPTINA AND SPECIES OF CRYPTUS  
(HYMENOPTERA, ICHNEUMONIDAE)

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ABSTRACT

Re-descriptions of European and some African and Asiatic species of *Cryptus* Fabricius, 1804, are presented, with designations of neotypes for: *Ichneumon apparitorius* C. de Villers, 1789, *Ichneumon leucocheir* Ratzeburg, 1844, *Cryptus immitis* Tschek, 1870, and *Cryptus bucculentus* Tschek, 1870, respectively, and of lectotypes for: *Ichneumon inculcator* Linné, 1758, *Ichneumon sponsor* Fabricius, 1793, *Ichneumon moschator* Fabricius, 1787, *Cryptus viduatorius* Fabricius, 1804, *C. tuberculatus* Gravenhorst, 1829, *C. hispanicus* Habermehl, 1918, *C. investigator* Tschek, 1870, *C. italicus* Gravenhorst, 1829, *C. triguttatus* Gravenhorst, 1829, *C. exstinctor* Tschek, 1870, *C. spinosus* Gravenhorst, 1829, *C. arenicola* Thomson, 1873, *C. quadrilineatus* Gravenhorst, 1829, *C. pungens* Gravenhorst, 1829, *C. gratosus* Tschek, 1870, *C. saidensis* Schmiedeknecht, 1900, *C. diana* Gravenhorst, 1829, *C. leucostomus* Gravenhorst, 1829, *C. borealis* Thomson, 1873, *C. minator* Gravenhorst, 1829, *C. armator* Fabricius, 1804, *C. incisus* Tschek, 1870, *C. difficilis* Tschek, 1870, *C. infumatus* Thomson, 1873, *C. baeticus* Seyrig, 1928, *C. subspinosus* Smits van Burgst, 1913, *C. rhenanus* Ulbricht, 1911, *C. speciosus* Tosquinet, 1896, and *C. maurus* Tosquinet, 1900.

One new form of *C. immitis* Tschek, 1870 is named: forma *perinsignis*. Some new synonymy is given. Some species formerly included in *Cryptus* are tentatively placed in *Synechocryptus* Schmiedeknecht, 1904, but this still requires further investigation. I regard *Cryptus annulicornis* Lucas, 1849, as nomen oblitum; and I shall inform the International Commission on Zoological Nomenclature thereof. The paper is illustrated by 58 figures.

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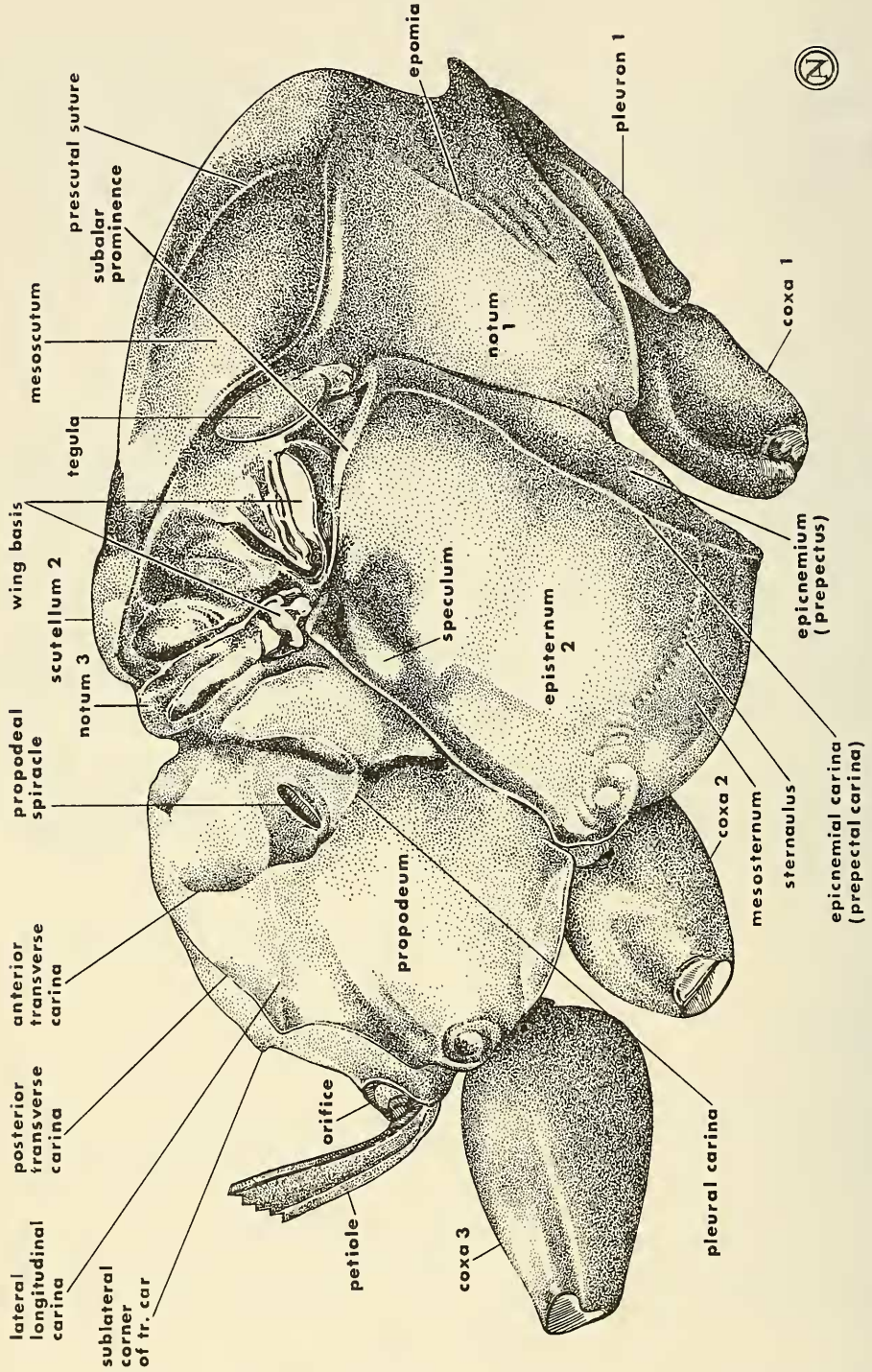


Fig. 1, *Gryllus armator* F., ♀, Piesting, coll. Tschek (NMW), thorax



## NOMENCLATURE

The classic genus *Cryptus* is being split up, e.g. in *Meringopus* (see van Rossem, 1969), *Buathra* and others. The relative position of these segregates in the subtribe Cryptina is shown in the key below. The subfamily Cryptinae, to which the Cryptina belong, has recently been re-arranged by Townes and Townes (1962). I wish to express my wholehearted admiration for this paper, but I consider it wiser not to follow their standpoint on the nomenclature for the subfamily (Gelinae), the tribe (Mesostenini) and the subtribe (Mesostenina). There has been some argument about the use of the name *Cryptus* and I believe that the best course is to abide the decision taken in 1939 by the International Commission on Zoological Nomenclature (Opinion No. 135). It is clear that the decision to suppress the use of Panzer's interpretation of the genus *Cryptus* has been taken to avoid inordinate confusion. I accept the Fabrician use of the name *Cryptus*. The judicial aspects of Opinion 135 have been reviewed by Townes (1969).

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## METHODS

External measurements were taken with an ocular micrometer (1 cm at 10  $\times$ ) on a Zeiss binocular low power microscope. All total sizes were taken at 10  $\times$  enlargement; the length of the ovipositor was measured from the apex of gaster. Most relative measurements, made for comparison of parts, were taken at 40  $\times$ . For length: breadth relations, e.g. of the femur and postanellus, I use the term "index". As differences in indices are often very small, students are advised to take measurements carefully and preferably at enlargements of more than 30  $\times$ . For terminology I follow Richards (1956). The thorax and its parts in *Cryptus* are shown in Fig. 1.

My biological notes are rather erratic. I have only taken up data which I came across when searching for taxonomic information.

## Technical abbreviations

- OOL — distance from the outer edge of a lateral (or posterior) ocellus to the compound eye (ocular-ocellar line)  
 POL — distance between the inner edges of the two lateral ocelli (postocellar line)  
 p — probability (= 0.10). The chance of error is 10 %.

## KEY TO THE WESTERN PALEARCTIC GENERA OF CRYPTINA

The following key to the genera of Cryptina in Western Europe is based on the key by Townes and Townes (1962). Nearctic genera have been omitted.

1. Lower half of frons, medio-dorsad of antennae, with small or large horn. Second tergite with close strong punctures . . . . . *Listrognathus*
- Frons without horn . . . . . 2
2. Areola: either almost rudimentary (Fig. 8), very small (Fig. 2), or with sides parallel, with its width greater than its height (Fig. 13). Second recurrent vein (2mcu) meeting base of areola near 3rm. If in doubt; several *Mesostenus* species have distinct, rather dense punctures on second tergite. Ovipositor longer than first tergite of gaster . . . . . *Mesostenus*
- Areola normal, always closed, rectangular (with sides sub-parallel or parallel, Fig. 14) or "triangular" (with sides convergent) . . . . . 3
3. Mesoscutum rather weakly convex, broad. Prescutal suture usually absent or short (except in *Hidryta*), seldom extending beyond middle of mesoscutum. Thorax short and first gastral segment elongate. The latter more than half as long as thorax. Tergite 2 usually polished and not conspicuously punctate . . . . . 4
- Mesoscutum more strongly convex, usually narrower. Prescutal suture usually extending beyond middle of mesoscutum. Second tergite often coriaceous, or evidently punctate, or both coriaceous and punctate . . . . . 6
4. Epicnemial carina ending near middle of hind margin of notum 1 (Fig. 27). Nervulus (cua) at, or distal of, basal vein (Rs+M). Epicnemium often with short vertical carina, which is sometimes developed into a rounded tooth-like structure (Fig. 28). Epomia usually strong . . . . . *Trychosis*
- Epicnemial carina reaching subtegular ridge (Fig. 26). Nervulus at, or basad of, basal vein. Epicnemium without vertical carina. Epomia usually weak or absent . . . . . 5

5. Sides of areola strongly convergent. Prescutal suture sharp, reaching at least to center of mesoscutum. Ovipositor tip rather abruptly tapered from a distinct nodus (Fig. 53). Clypeus moderately small . . . . . *Hidryta*
- Sides of areola subparallel (Fig. 14). Prescutal suture absent or weak and short, not reaching center of mesoscutum. Ovipositor tip gradually tapered from an indistinct nodus. Clypeus large . . . . . *Idiolispa*
6. Propodeum with lateral longitudinal and pleural carinae distinct, more or less complete (Fig. 38). Pubescence of head and thorax very dense. Apical margin of clypeus truncate or somewhat concave, without median tooth or lobe . . . . . *Apsilops*
- Propodeum without lateral longitudinal and pleural carinae<sup>1</sup>). Pubescence of head and thorax varying from sparse to dense . . . . . 7
7. Middle part of medial vein in hind wing (M+Cu1) rather weakly to strongly arched (Fig. 49 and 52). Propodeal spiracle round to short elliptic. Tergite 7 often with large median white spot . . . . . 8
- Middle part of medial vein in hind wing almost straight (Fig. 50, 51). Propodeal spiracle circular, minute or short elliptic to long and slit-like. Mesoscutum polished between punctures. Tergite 7 without white spot . . . . . 13
8. Clypeus with distinct median tooth on anterior margin. Second tergite with strong punctures . . . . . *Aritranis*
- Clypeus without distinct median tooth . . . . . 9
9. Sides of areola parallel. Areola more often large . . . . . 10
- Sides of areola convergent. Areola not large . . . . . 12
10. Mesoscutum with stronger or weaker alutaceous microsculpture between punctures . . . . . *Gambrus*
- Mesoscutum polished, in most cases strongly punctate . . . . . 11
11. Ovipositor conspicuously longer than gaster in the two western Palearctic species. Postpetiole strongly convex in female. It is difficult to separate males of *P. director* (Thunb.) from those of *Agrothereutes*. At least the following characters should be found in combination: propodeum flat, both transverse carinae present though weak, remote from each other. Propodeal spiracle round. Index of hind femur about 4.7, hence stout . . . . . *Pycnocryptus*
- Ovipositor not longer than gaster. Propodeum more often with posterior part strongly sloping. Posterior transverse propodeal carina nearly always obliterated medially. Hind tibia often with whitish basal band . . . . . *Agrothereutes*
12. Medial vein (M+Cu1) in hind wing arched to conspicuously arched (Fig. 52). Second tergite coriaceous with moderately dense to scattered punctures. Sculpture of mesoscutum variable: in some species finely alutaceous, in others polished between punctures . . . . . *Ischnus*
- Medial vein in hind wing almost straight. Mesoscutum very densely sculptured with fine punctures, mat. Second tergite with very dense microsculpture *Habrocryptoides*
13. Dorsal tentorial pits (Fig. 33) clearly visible . . . . . 14
- Dorsal tentorial pits not apparent . . . . . 15
14. Axillary vein (3A) in hind wing diverging from, or parallel to, inner hind margin of wing (rarely converging). Dorsal tentorial pits usually well developed; when poorly developed the gaster is mostly black with bluish or violet iridescence . . . . . *Meringopus*

<sup>1</sup>) Rarely the lateral longitudinal carina is present in *Cryptus*, compare *C. moschator* and *C. fibulatus*.



- Axillary vein convergent to inner hind margin of wing, weakly pigmented. Dorsal tentorial pit well-developed . . . . . *Buathra*
- 15. Mesoscutum very densely sculptured with fine punctures, mat. Second tergite with very dense microsculpture . . . . . *Habrocryptoides*
- Mesoscutum polished between rough or fine punctures, not mat . . . . . 16
- 16. Propodeal spiracle circular, minute. Index of diameter lateral ocellus : diameter propodeal spiracle greater than 1.4 (4.0 in the type-species) . . . . *Caenocryptus*
- Propodeal spiracle usually elliptic, shortly elliptic, sub-circular or, rarely, circular. In the last case index of diameter lateral ocellus : diameter propodeal spiracle less than 1.4 . . . . . 17
- 17. With the following combination of characters: at least second tergite of gaster with conspicuous and densely placed punctures. Head, mesoscutum and propodeum orange to fuscous red or with traces of such colour. Head and thorax may be entirely black, but then the gaster has one or more white bands, which never occurs in *Cryptus*. Ovipositor long, between about 0.63—1.0 length of front wing. In one species, tentatively placed in this genus, (*S. crenulatus*) the female has head and thorax entirely black, without white bands on gaster, but second and third tergites are very coarsely and densely punctured (in *Cryptus* rarely so). In *S. crenulatus* ovipositor reaches length of front wing and propodeal spiracle is small and subelliptic (Fig. 3 and 5) . . . . . *Synechocryptus*
- Gastral tergites in most species without coarse and dense punctures. If such punctures occur, which is rare, this is never combined with orange or red coloured head, mesoscutum and propodeum, nor with white bands on gaster . . . . *Cryptus*

KEY TO THE MALES OF *Cryptus* FABRICIUS S.STR. AND  
SOME SPECIES IN A RELATED GENUS

Males of *C. genalis* and *C. medius* unknown. Male of *C. immitis* not known with certainty and not included in the key. Male of *Synechocryptus crenulatus* (Brauns) unknown.

- 1. Axillary vein in hind wing (Fig. 57) diverging from inner hind margin of wing. Scutellum 2 relatively large, flat, polished, with few scattered punctures. Both propodeal transverse carinae obliterated, the posterior sublaterally indicated by small crescentic teeth. Propodeum roughly rugose . . . . . *C. attentorius* (Panzer)
- Axillary vein not diverging from inner hind margin of wing; in most specimens either convergent or parallel to inner margin of wing. Remaining characters combined not as above . . . . . 2
- 2. First gastral segment reaching length of first four segments of flagellum (= 3—6 segment of antenna), long and slender. Genal carina meeting hypostomal carina at right angle, at a distance somewhat less than basal width of mandibula from lower mandibular condyle. Both these carinae developed into lamellae in most specimens. OOL : diameter lateral ocellus, 12 : 7; OOL broad. Both propodeal carinae well-developed and almost parallel, with rough longitudinal wrinkles connecting them. Outer sides of front and middle tibiae with dirty ivory to light yellow streak. Tergite 2 with vague punctures between microsculpture (at 100 × magnification) . . . . . *C. italicus* Grav.
- First gastral segment not reaching length of first four segments of flagellum. Combination of other characters not as above . . . . . 3

3. Tergite 2 with distinct or indistinct but densely placed punctures between microsculpture (these punctures are best seen in bright grazing light at 40 × magnification). From the punctures adpressed setae arise . . . . . 4
- Tergite 2 either widely punctured or without distinct punctures between microsculpture, or almost polished . . . . . 8
4. Areola with subparallel or parallel cubital cross veins (2rm and 3rm) (Fig. 3 and 5), thus subrectangular to square in shape, size medium to large. Mesoscutum partly orange and/or gaster with ivory band(s). *Synechocryptus*, a southern Palearctic and Ethiopian genus . . . . . 5
- Areola with cubital cross veins definitely converging, thus triangular in appearance (Fig. 4 and 16). Combination of other characters not as above . . . . . 6
5. Gaster black with at least one or two bright ivory white bands. Mesoscutum polished, but with rather dense punctures. A southern Palearctic species . . . . .  
*Synechocryptus mactator* (Tschek)
- Gaster with at least the first four tergites ranging from ferruginous to somewhat dirty orange-red. In some specimens posterior margin of tergite 3 (and 4) may show a yellowish colour. Mesoscutum orange, highly polished in lateral parts and with widely scattered punctures. A southern Palearctic species . . . . .  
*Synechocryptus bovei* (Brullé)
6. Gaster entirely black (except for vague ferruginous apical margins of tergites), with very conspicuous long adpressed greyish-brown, dense setae. Sculpture of tergite 2 rather variable: alutaceous to roughly alutaceous with indistinct setiferous punctures, or these punctures may be lacking completely (compare item 14). Appearance of head rather striking on account of convex compound eyes. Antennal scrobes polished; upper frons somewhat rugose to alutaceous, with shallow punctures. Boundary between polished lower frons and alutaceous upper frons strikingly sharp. Mesoscutum regularly and finely punctured, polished. Scutellum 2 with minute, widely placed, setiferous punctures. Propodeal spiracle shortly elliptic, index, 1.4—1.5. Anterior propodeal carina complete, posterior carina medially obliterated, sublaterally with somewhat crescentic, weak-to-very-weak teeth. All femora and tibiae bright orange to orange-yellow. Hind tarsus with apical half of basitarsus and segments 2, 3 and 4 white (Fig. 4) . . . . . *C. lugubris* Grav.
- Gaster partly or completely orange. Remaining characters combined not as above . 7
7. Tergite 2 with dense punctures between microsculpture. Both propodeal transverse carinae well-developed. Hind femur normal in shape, index about 5.3. Hind tarsus in typical specimens brown. A central and southern Palearctic species . . . . .  
*C. triguttatus* Grav.
- Tergite 2 with dense, rather indistinct punctures between microsculpture. Posterior propodeal transverse carina obliterated, sublaterally indicated by small teeth. Hind femur conspicuously stout, index about 4.6. A northern Palearctic species . . . . .  
*C. arenicola* Thomson
8. Tergite 2 almost polished, with fine setiferous punctures and very fine alutaceous microsculpture. Doubtful specimens may have too much microsculpture on tergite 2 to pass for "polished". However, in *C. leucocheir* the silvery pubescence on temple and gena is always short and rather adpressed, compared with e.g. *C. armator* males. Large specimens of 13.5—14.7 mm . . . . . *C. leucocheir* Ratzebl.
- Tergite 2 with more conspicuous microsculpture . . . . . 9

9. Areola with subparallel or parallel cubital cross veins (2rm and 3rm) (Fig. 10 and 15), anterior side thus long and areola sub-rectangular to square<sup>1)</sup> . . . 10
- Areola with cubital cross veins definitely converging, hence shape more "triangular" (Fig. 6 and 11, 18) . . . . . 12
10. OOL region subpolished, with indistinct microsculpture and some scattered punctures. Index of propodeal spiracle, 2.0—3.0, elliptic. Colour pattern bright (see page 346), hind coxae ferruginous to orange. Posterior propodeal carina in most specimens with ivory-yellow lining. Gaster orange to dirty ferruginous . . . . . *C. inculcator* (L.)
- OOL region conspicuously alutaceous with some scattered punctures between. Index of propodeal spiracle about 1.8 (shortly elliptic) to almost circular. Posterior propodeal carina never lined with ivory. Hind coxae black. Gaster fuscous . . . . . 11
11. Lateral longitudinal carina of propodeum completely developed between anterior margin of propodeum and sublateral teeth of posterior carina. Scutellum 2 with fine, densely placed, setiferous punctures. Propodeal spiracle almost circular. Head black, entirely without ivory markings. Smaller, rather stout specimens, front wing 7.0—9.0 mm (Fig. 35) . . . . . *C. fibulatus* Grav.
- Lateral longitudinal carina of propodeum not completely developed between anterior margin of propodeum and sublateral teeth of posterior carina. Punctures on scutellum 2 not very dense. Propodeal spiracle shortly elliptic, index about 1.8. In western Palearctic material the head is richly marked with ivory. Larger, slender specimens; front wing longer than 9.0 mm in normally developed males . . . . . *C. luctuosus subquadratus* Thoms.
12. Lateral longitudinal carina of propodeum completely developed between anterior margin of propodeum and sublateral teeth of posterior carina (Fig. 35 and 36) . . . 13
- Lateral longitudinal carina of propodeum not completely developed . . . . . 14
13. Scutellum 2 with dense, rather fine setiferous punctures. Propodeal spiracle almost circular. Head entirely without ivory marking. Gaster black. See item 11 . . . . . *C. fibulatus* Grav.
- Scutellum 2 more roughly punctured. Propodeal spiracle subelliptic, index about 1.5. Entire posterior propodeal carina strongly developed, crest-like, with sublateral corners rather strongly dentated, but teeth not rising much above level of crest (Fig. 36). Gaster black, head usually with ivory markings . . . *C. moschator* (Fabricius)
14. Scutellum 2 with minute, widely placed, setiferous punctures. Propodeal spiracle shortly elliptic, index 1.4—1.5. Anterior propodeal carina complete, posterior carina obliterated, sublaterally with rather weak teeth. Gaster fuscous. Compare item 6 . . . . . *C. lugubris* Grav.
- These characters combined not as above. Scutellum 2 without very fine setiferous punctures . . . . . 15
15. Entire posterior propodeal carina conspicuously developed, crest-like, with sublateral corners rather strongly dentated, but teeth not rising much above level of crest (Fig. 36). Gaster black. Head and thorax in most specimens with ivory marking. Compare item 13 . . . . . *C. moschator* (Fabricius)
- Entire posterior propodeal carina not conspicuously raised. Sublateral corners of posterior carina may be strongly developed; they can be horn-like or teeth-like, sub-crescentic, weak or absent . . . . . 16

<sup>1)</sup> Doubtful cases should be traced through the other half of couplet.



- 16 Sublateral corners of posterior propodeal carina horn-like (Fig. 40); or developed into conspicuous blunt teeth, abruptly rising above level of carina. If in doubt: area superomedia more or less indicated in *C. spinosus* and *C. subspinosus*; or outer sides of front and middle tibiae with ivory streak (*C. gogorzae*); or compare specimen with item 12 (some specimens of *C. moschator* show rather strong sublateral dentation) . . . . . 17
- Sublateral corners of posterior transverse carina not horn-like, more often weak. Posterior carina sometimes medially obliterated but sublaterally indicated by sub-crescentic or weak teeth. If in doubt: area superomedia not indicated . . . . . 19
17. Sublateral teeth of posterior propodeal carina in characteristic specimens horn-like (Fig. 40)<sup>1</sup>). Both propodeal carinae well developed and area superomedia indicated. Silvery hairs on face, temple and gena very conspicuous, reaching width of POL. OOL : diameter posterior ocellus, 1 : 1. Head and thorax with conspicuous ivory marking. Thorax with dense suberect silvery bristles. Index of hind femur, 6.1—6.5. Gaster with black petiole; all tergites orange . . . . . *C. spinosus* Grav.
- Sublateral teeth of posterior propodeal carina strong, but not horn-like, abruptly rising from level of carina. Silvery bristles on face, temple and gena but less conspicuous than in *C. spinosus*. Head and thorax not abundantly marked with ivory. OOL slightly wider than diameter posterior ocellus. Gaster not orange, either somewhat dirty red, fuscous-red or completely black in typical specimens of *C. gogorzae* . . . . . 18
18. Sublateral teeth of posterior propodeal carina strong but not horn-like; in characteristic specimens somewhat weaker than in *C. spinosus*. OOL : diameter lateral ocellus, 8 : 6. Area superomedia indicated. Silvery bristles on face, temple and gena present but less conspicuous than in *C. spinosus*. Index hind femur about 5.0. Gaster tending to dirty red or fuscous red . . . . . *C. subspinosus* Smits van Burgst
- Sublateral teeth of posterior propodeal carina well defined, pyramidal, but not strong. OOL : diameter of lateral ocellus, 8 : 7. Almost completely black except for some dirty yellow marking on mandibles, inner orbits and a streak of ivory on outer sides of front and middle tibiae (the latter is a distinctive character). First segment of gaster black, following tergites fuscous red to almost completely black. Sculpture of thorax rough. Index of hind femur, 5.8 . . . . . *C. gogorzae* Kriechb.
19. Head and thorax with very conspicuous long, brownish hairs reaching width of OOL. Malar space very broad, somewhat less than length of fourth antennal segment. Epomia lacking. Propodeal spiracle small, subcircular, index 1.3. Greenland and mountainous and arctic zones of America . . . . . *C. arcticus* Schiødte
- Combination of characters not as above . . . . . 20
20. Colour pattern very conspicuous (see pag. 349). Hind coxae black with white spot. Anterior side of areola about 0.25 of sum total of anterior and converging sides (Fig. 9). Axillary vein in hind wing convergent to inner hind margin of wing. Index of propodeal spiracle about 1.6, subcircular. *C. apparitorius* (de Villers) <sup>2</sup>)
- No such characters combined . . . . . 21
21. Position of tyloidea very characteristic: on antennal segments 12—22 (variations:

<sup>1</sup>) Some males of *C. spinosus* have the sublateral corners of the posterior carina not horn-like.

<sup>2</sup>) This male is included tentatively.

- 12—20; 13—22). Width of gena at base of eye : width of eye, 5 : 4 (variation: 1 : 1). A southern Palearctic species . . . . . *C. bucculentus* Tschek
- Position of tyloidea different . . . . . 22
22. Both genal and hypostomal carinae raised to conspicuous lamellae; genal carina not running into hypostomal carina but leaving a gap. OOL : diameter lateral ocellus, 1 : 1. Head and thorax with long, grey pilosity. Lower frons concave, antennal scrobes polished. Episternum 2 polished, with some striking dorso-ventral wrinkles. Propodeum with both carinae, rough longitudinal wrinkling between them. Petiole of gaster fuscous, following tergites orange. Some aberrant (?) specimens in Tschek's collection . . . . . *C. armator* f. *incisus* Tschek
- Genal and hypostomal carinae without a conspicuous gap . . . . . 23
23. Tyloidea on antennal segments 18/19—23, in combination with the following characters: head with very conspicuous ivory-yellow markings: palpi, labrum, mandibles, clypeus, entire face, malar space, scapi, inner frontal orbits, outer orbits. Long silvery hairs on mandibles, clypeus, face, temple, gena and vertex. Lower frons polished, with transverse wrinkling, concave. Upper frons alutaceous to almost polished, seldom slightly rugose around ocelli. OOL region almost polished. OOL : diameter lateral ocellus, 1 : 1 (variations: 9 : 7; 5 : 4). Also thorax with conspicuous ivory-yellow markings. Epomia weak. Indices of femora: 5.0—5.9 (1); 6.3—6.6 (2); 5.2—5.9 (3). Petiole of gaster fuscous and following tergites orange . . . . . *C. armator* Fabricius
- No such characters combined . . . . . 24
24. Head orange, with black spots round antennal sockets, malar space and part of head beyond geno-occipital carina. Tyloidea on antennal segments 19—22. OOL : diameter of lateral ocellus, 1 : 1. Lower frons highly polished. Medial and ocellar region of frons with fine wrinkling. Head with silvery hairs. Thorax strongly marked with orange: notum 1 dorsally and ventral margin, mesoscutum, scutellum 2 and notum 3. Anterior and lateral margins of mesoscutum and prescutal sutures black. Episternum 2 with orange spot. Thorax with silvery bristles, giving it a brilliant appearance. Gaster orange. Spain . . . . . *C. baeticus* Seyrig
- Body not conspicuously marked with orange. Tyloidea occurring below the 18th antennal segment . . . . . 25
25. Index of front femur 4.0—4.4, appearance stout. Tyloidea on antennal segments 15—23 (14—22). Greater part of face in most specimens ivory-yellow. Lower gena broad, width about equal to breadth of compound eye. Gaster fuscous to black in most specimens, but tergites 2 and 3 may tend towards ferruginous . . . . . *C. spiralis* (Geoffroy)
- Tyloidea not lower than 15th segment of antenna. Index of front femur rarely below 4.4 (this figure is not fully reliable). Face never completely ivory-yellow . . . . . 26
26. Upper frons convex, almost polished. OOL : diameter lateral ocellus, 5 : 4. Antennal scrobes vaguely indicated. Tyloidea on antennal segments 15—19. Face with silvery hairs, medially black with ivory spot on central convexity. Front coxae and trochanter marked with ivory, middle coxae with minute spot. Areola as in Pl. 1 Fig. 10. Propodeal spiracle subcircular. Gaster slender, tergites 2, 3 and 4 dirty orange, other parts black (specimens with a more ferruginous gaster may occur). Very small specimens . . . . . *C. minor* Grav.<sup>1)</sup>

<sup>1)</sup> This male is included tentatively.

- Upper frons declivous ventrally of median ocellus, rugose, alutaceous or densely punctured, but not polished . . . . . 27
- 27. OOL : diameter of lateral ocellus<sup>1)</sup>, 7 : 6 (variations: 7 : 5; 8 : 6 and 1 : 1). Index of OOL and lateral ocellus lying between 1.0—1.3 ( $p = 0.10$ ). Upper frons alutaceous to finely punctured. OOL region finely punctured and subpolished with some microsculpture. Tyloidea on antennal segments 17—20/21. Index front femur, 5.0—5.4; hind femur, 5.0—6.1. Head and thorax with conspicuous silvery hairs. Areola as in Pl. 1 Fig. 1. Hind femur orange to fuscous orange, hind tibia brownish. Hind tarsus usually with segments 2, 3 and 4 white. Gaster bright orange to somewhat dirty orange, some specimens have tergites 5, 6 and 7 fuscous . . . . .  
 . . . . . *C. titubator* (Thunb.)
- OOL : diameter of lateral ocellus, 11 : 7; 10 : 6; 9 : 7; 9 : 6; 8 : 6; 7 : 5. Index of OOL and lateral ocellus lying between 1.3—1.6 ( $p = 0.10$ ). Upper frons mostly rugose . . . . . 28
- 28. With the following combination of colour characters: central convexity of face rarely marked with ivory; hind femur mostly fuscous; hind tarsus usually with base of segments 2, 3 and 4 marked white, giving the whole a chequered appearance; some specimens may have 3rd and 4th segments white and could be confused with *C. diana*, but for the anterior side of areola which is wider than in *C. diana*. First gastral segment mostly fuscous, tergites 2, 3 and 4 more often dirty reddish, apex fuscous. Fuscous hind femur may cause confusion with *C. diana obscuripes* but in the latter at least gastral tergites 2—6 are bright orange, segments 2—4 of hind tarsus being bright white. Index of OOL and diameter lateral ocellus, 1.3—1.6; index of hind femur, 4.7—5.2. Confusion with *C. diana*, *C. diana obscuripes* and *C. viduatorius* with orange tergites is difficult to avoid . . . . .  
 . . . . . *C. tuberculatus* Grav.
- Not the above combination of characters . . . . . 29
- 29. Hind femur relatively stout, index 5.0—5.2. Colour of gaster rather constant, fuscous to black (specimens with one or more tergites ferruginous or orange may turn up!). Index of front femur, 4.5—5.2. Tyloidea on antennal segments 16/17—21/22/23. OOL : diameter of lateral ocellus 9 : 6; 8 : 6; 7 : 5 . . . *C. viduatorius* Fabricius
- Hind femur relatively slender, index 5.2—6.2. Gaster with at least tergites 2, 3 and 4 orange. OOL : diameter lateral ocellus, 11 : 7; 10 : 6; 9 : 7; 9 : 6 . . . 30
- 30. Colour of gaster rather constant; tergites 2, 3 and 4 orange, 5, 6 and 7 (apex) fuscous to black. OOL comparatively wide. Frontal aspect of head, Fig. 44. Upper frons rugose. Index front femur, 4.4—5.2. Hind femur orange. Areola Pl. 1 Fig. 8. . . . .  
 . . . . . *C. diana diana* Grav.
- Gaster with petiole fuscous to dark red, postpetiole and tergites 2—6 orange, apex somewhat fuscous. Width of OOL falling within the range of *C. diana diana* Grav. Upper frons rugose. OOL region alutaceous. Index front femur, 5.0. Hind femur fuscous, index 5.2. Areola as in Pl. 1 Fig. 2, its anterior side slightly longer than in the nominate form. Both propodeal carinae developed, showing a pattern as in Fig. 20. A Fennoscandian (alpine) subspecies of *C. diana* . . . . .  
 . . . . . *C. diana obscuripes* Zett.

<sup>1)</sup> Measurements should be taken with great care. OOL is the shortest distance between compound eye and lateral ocellus. The diameter of the lateral ocellus is to be measured at right angles to plane.



KEY TO THE FEMALES OF *Cryptus* FABRICIUS S.STR. AND SOME  
SPECIES IN A RELATED GENUS

(the females of *C. gogorzae*, *C. diana* *speciosus* and *C. baeticus* are not included)

1. Second gastral tergite with conspicuous, coarse and close punctures (Fig. 24). Some specimens of *C. italicus* have punctures on tergite 2 indistinct or only vaguely visible in basal region of tergite. In doubtful cases compare item 5 . . . . . 2
- Second tergite without conspicuous, coarse and close punctures. Punctures, if present, widely spaced . . . . . 6
2. Head, mesoscutum and propodeum orange to fuscous red or with traces of such colour. Head and thorax may be entirely black, but if so then gaster with one or more white bands, never present in *Cryptus* . . . . . 3
- Head, thorax and gaster not variegated with orange, red and/or white . . . . . 4
3. Mesoscutum black. Scutellum 2 and propodeum orange. Gaster with postpetiole and spot on second tergite orange. Apical margin of tergite 3 broadly white. Ovipositor long and slightly curved, about 0.79—0.90 length of front wing. The f. *erberi* Tschek, 1871, also has part of head and mesoscutum orange, including tergite 2. Other interrelated colour forms occur. Species found along entire northern edge of African continent, in the eastern Mediterranean basin and probably deep into Central Asia . . . . . *Synechocryptus mactator* (Tschek, 1870)
- Apical margin of tergite 3 without white band. Punctures on tergite 2 more vague and ovipositor slightly shorter than in *S. mactator*: 0.62—0.66 length of front wing. Head usually completely orange, thorax with dorsal part of notum 1, mesoscutum and propodeum orange, gaster usually with first two segments orange to brownish and apex more fuscous . . . . . *Synechocryptus bovei* (Brullé, 1846)
4. Ovipositor curved, long, slightly shorter than front wing. Tergites 2 and 3 densely and very coarsely punctured; tergite 7 with white spot; gaster fuscous ferruginous. Areola small, sides converging. Propodeal spiracle small, subelliptic . . . . .  
. . . . . *Synechocryptus*<sup>1)</sup> *crenulatus* (Brauns, 1896)
- Ovipositor shorter: other characters combined not as above . . . . . 5
5. Genal carina meeting hypostomal carina at a right angle, at a distance somewhat less than basal width of mandibula (Fig. 43); both carinae developed into lamellae. OOL : diameter of lateral ocellus, 1 : 1. Hind femur slender, index about 6.0. Scutellum black . . . . . *Cryptus italicus* Grav.
- Genal carina meeting hypostomal carina at much wider angle, at a distance much less than basal width of mandibula; these carinae not lamelliform. OOL : diameter of lateral ocellus, 3 : 2. Hind femur stout, index about 4.6—4.7. Scutellum marked with ivory . . . . . *C. triguttatus* Grav.
6. The following combination of characters: Front tibia inflated, index 4.1; all femora short and stout, indices respectively: 3.1 (1), 3.0 (2), 3.1 (3). Antenna with abnormally short and stout segments, index of postanellus, 2.7. The only available specimen, the holotype, shows resemblance to *C. inculcator* (see item 23). It also could be confused with *C. attentorinus*, item 9, which has a long and curved ovipositor. Gaster orange . . . . . *C. genalis* Tschek
- No such combination of characters . . . . . 7

<sup>1)</sup> The generic position of this remarkable species is uncertain. I have only seen the type specimen. It bears a label "Wallis", but on the underside of the same label "Schwerin".

7. Sublateral corners of posterior transverse propodeal carina developed into very conspicuous horns (Fig. 39). Frons not deeply concave . . . *C. spinosus* Grav.
- Sublateral corners of posterior transverse carina either not or only slightly developed, but *not* horn-like . . . . . 8
8. Length of ovipositor more than 0.67 length of front wing . . . . . 9
- Length of ovipositor less than 0.67 length of front wing . . . . . 12
9. Postanellus very short, index 2.7—3.3. Frons rather concave. Scutellum 2 large and flat. Propodeum with a vague or without indication of transverse carinae, only sublateral corners of posterior carina indicated as small teeth. Propodeum more or less rounded, roughly rugose, with tendency towards longitudinal ridges. Gaster with postpetiole polished, following tergites very finely coriaceous to sub-polished. Ovipositor very long, curved, 7.0—8.0 mm. Femur 3 stout, index 4.0—4.7 (Fig. 57) . . . . . *C. attentorius* (Panzer)
- Index of postanellus in normal specimens greater than 4.0 . . . . . 10
10. Entire frons concave. Ovipositor long, about 0.75 length of front wing, slightly curved. Lower gena hairless, almost polished with some scattered punctures. Index of postanellus, 5.8. OOL : diameter lateral ocellus, 9 : 5. Indices of femora: 4.1 (1); 4.2 (2); 5.1 (3). Gaster with only tergites 2 and 3 orange. A species from the Alai Range (USSR) . . . . . *C. medius* Szépligeti
- Upper half of frons not concave, slightly convex . . . . . 11
11. Mostly small specimens, front wing about 4.5—6.4 mm. Ovipositor long, 0.67—0.71 length of front wing. Front tibia somewhat inflated, index 5.0—6.0. Upper half of frons somewhat convex, lower half (antennal scrobes) somewhat concave to concave. Index of postanellus, 6.0—7.0. Propodeal spiracle usually small, short elliptic. Both propodeal carinae present, differing somewhat in position from *C. immitis* Tschek (Fig. 21). Sublateral corners of posterior carina rather dentated. Gaster rufous to orange, conspicuously alutaceous . . . . . *C. minator* Grav.
- Larger specimens, front wing 7.4—7.5 mm. Ovipositor about 0.72 length of front wing. Front tibia somewhat inflated, index about 6.2. Upper half of frons convex, lower half (antennal scrobes) somewhat concave. Index of postanellus, about 6.1. Propodeal spiracle relatively small, short elliptic. Both propodeal carinae present, with indication of area superomedia (Fig. 29) . . . . . *C. immitis* Tschek
12. Ovipositor short, less than 0.40 length of front wing . . . . . 13
- Ovipositor longer, 0.40—0.67 length of front wing . . . . . 18
13. Malar space exceptionally broad, about 2 × width of mandibular base. Postanellus very slender, index 7.0. Both head and thorax covered with long, widely spaced, erect hairs, reddish in bright light. Head in frontal aspect triangular, relatively flat in antero-posterior line. Ovipositor 0.37 length of front wing (Fig. 11) . . . . . *C. arcticus* Schiodte
- Malar space not exceptionally broad and remaining characters not as described 14
14. Front tibia conspicuously inflated (Fig. 37), index 4.1—4.6<sup>1)</sup>. Ovipositor very short, 0.24—0.27 length of front wing. Upper frons rugose. OOL : diameter lateral ocellus, 9 : 6; 8 : 6; 8 : 5. Gaster for the greater part orange . . . . . *C. tuberculatus* Grav.
- Front tibia not or slightly inflated . . . . . 15

<sup>1)</sup> For this index the greatest width of the tibia should be taken about dorsally.

15. Ovipositor 0.35—0.40 length of front wing. Front tibia somewhat inflated. Upper frons finely alutaceous (Fig. 41 and 42). OOL : diameter lateral ocellus, 1 : 1. Gaster orange. Specimens of 7.0—10.3 mm . . . . . *C. titubator* (Thunb.)
- Ovipositor shorter, between 0.20—0.30 length of front wing. Species in this item have the gaster black or at most deeply fuscous-ferruginous . . . . . 16
16. Propodeal spiracle definitely slit-like (elliptic). Cubital cross veins somewhat converging. Scutellum 2 with densely placed, very fine setiferous punctures. Both propodeal carinae present, though obsolescent medially. Gaster black or tending to deep fuscous-ferruginous. Ovipositor 0.29 length of front wing . . . . . *C. lugubris* Grav.
- Propodeal spiracle almost circular to subcircular. Cubital cross veins more often weakly converging in *C. luctuosus subquadratus*, or more definitely converging in *C. fibulatus*. Scutellum 2 without strikingly fine, dense punctures. Propodeal carinae completely developed, sometimes obsolescent medially; or anterior one obliterated . . . . . 17
17. Antenna without white band. In many specimens the cubital cross veins are not strongly diverging; areola with broad anterior side, thus "subquadrate" (Fig. 10). In many specimens both propodeal carinae complete. Propodeal spiracle almost circular or subcircular, without giving the impression of being slit-like. Ovipositor 0.20—0.30 length of front wing (Fig. 54) . . . . . *C. luctuosus subquadratus* Th.
- Antenna with white band. In the sparse material the cubital cross veins are more strongly converging, areola thus not "subquadrate". Anterior propodeal carina completely obliterated, the posterior one complete. Propodeal spiracle weakly subcircular. Ovipositor 0.28 length of front wing . . . . . *C. fibulatus* Grav.
18. Index of postanellus 5.1 or less than 5.1 . . . . . 19
- Index of postanellus greater than 5.1 . . . . . 24
19. Hind femur stout, index about 4.2. Index of postanellus 5.0. Lower frons slightly concave, upper frons slightly convex. Frons finely rugose. OOL : POL, 9 : 10. Temple and gena densely punctured, but shiny. Propodeum with both transverse carinae rather obliterated. Sublateral corners of posterior carina developed into small teeth. Ovipositor about 2.7 mm. A small boreal species of about 9.0 mm . . . . . *C. arenicola* Thomson
- Hind femur normal; combined characters not as above . . . . . 20
20. Anterior side of areola narrow, less than half as long as third cubital cross-vein (3rm) (Fig. 7), or anterior side about half as long as third cubital cross-vein (Fig. 22 and 23) . . . . . 21
- Anterior side of areola more than half as long as third cubital cross-vein (3rm). Areola rather rectangular to square (Fig. 12, 17 and 25) . . . . . 23
21. Entire frons deeply concave (Fig. 32 and 34). OOL : diameter lateral ocellus, 1 : 1, or OOL slightly wider (8 : 7). Median upper half of frons coriaceous or only very slightly rugose. Index of postanellus, 4.5—5.9. Ovipositor about half length of front wing. Scutellum black. Gaster (except first tergite) orange. Length of front wing, 7.0—10.0 mm. See item 25 . . . . . *C. armator* Fabricius
- Entire frons not deeply concave . . . . . 22
22. OOL usually about equal to diameter lateral ocellus. Front femur rather stout, index 3.7—4.2. Anterior transverse carina of propodeum weak or absent, the posterior



- carina strong, sublaterally crested. Propodeal spiracle shortly elliptic, index 1.6. Ovipositor 0.44—0.60 length of front wing. Scutellum black. Gaster fuscous to black . . . . . *C. moschator* (Fabricius)
- OOL wider than diameter lateral ocellus. Front femur more slender, index about 4.4—5.4. Anterior carina of propodeum present, posterior carina not conspicuously strong. Propodeal spiracle in specimens of normal size more slit-like. Index of postanellus, 4.5—6.3. Front tibia inflated, index 4.5—5.5. Ovipositor 0.48—0.62 length of front wing (Pl. 1 Fig. 7). Scutellum always marked with ivory. Gaster fuscous to bright orange. See item 29 . . . . . *C. viduatorius* Fabr.
23. OOL about  $2 \times$  diameter of lateral ocellus. Tip of ovipositor characteristic (Fig. 48). All femora relatively short and stout, indices: 3.7—3.9 (1) and 4.4—4.8 (3). In the North African form all femora are bright orange. Ovipositor 0.38—0.41 length of front wing. Southern Europe and North Africa . . . . . *C. bucculentus* Tschek
- OOL about equal to diameter of lateral ocellus. Tip of ovipositor as in Pl. 1 Fig. 3 and 4; and Fig. 46. The commonest species in this group, *C. inculcator*, has the coxae bright orange . . . . . *C. inculcator*-group (for key see page 345)
24. OOL : diameter lateral ocellus, 1 : 1 or 7 : 6 . . . . . 25  
 OOL wider than diameter lateral ocellus . . . . . 26
25. Anterior transverse propodeal carina absent, only sublaterally indicated by a slight knob or tubercle; posterior carina complete, raised into a conspicuous blunt ridge, sublaterally developed into strong teeth (almost horns in one specimen, Fig. 19). Dorsal part of propodeum heavily and regularly wrinkled. Antennal scrobes rather concave, large, occupying about 0.6 of frons, polished or subpolished. Index of postanellus 5.0—5.6. Ovipositor relatively long, about 0.50—0.60 length of front wing, curved; tip of the *Meringopus titillator* type (compare van Rossem, 1969). Length of front wing 7.5—8.0 mm (2 specimens) . . . . .  
 . . . . . *C. subspinosus* Smits van Burgst
- Anterior transverse carina well indicated; posterior carina running up rather steeply, horseshoe-shaped. Relation between sloping part of propodeum : horizontal part, about 9 : 5. Entire frons deeply concave (Fig. 32 and 34). Median upper half of frons coriaceous or only very slightly rugose. Index of postanellus, 4.5—5.9 Ovipositor about half length of front wing, the latter 7.0—10.0 mm (Fig. 47) . . .  
 . . . . . *C. armator* Fabr.
26. Postanellus very slender, index 7.0—8.0 (allowance should be made for a slightly lower index). Upper frons weakly to strongly rugose (Fig. 45). Epomia well-developed. Areola (Pl. 1 Fig. 2). Ovipositor of moderate length: in larger specimens 0.55—0.60, in smaller specimens 0.48—0.53 length of front wing. Sublateral corners of posterior propodeal carina with rather strong dentation (exceptionally almost horn-like!) (Fig. 30). Index of front femur 4.1—5.0. Hind femur red to orange red. All coxae black. Postpetiole and tergites 2, 3 and 4 mostly orange to dirty red; apex of gaster fuscous . . . . . *C. diana diana* Grav.
- Index of postanellus 7.0 or less than 7.0 . . . . . 27
27. Front femur relatively stout, index 4.1—4.5. Front tibia slender, index 6.0—6.8. Index of postanellus 5.0—5.6. Gaster always fuscous. Tip of ovipositor as in Pl. 1 Fig. 6 . . . . . *C. spiralis* (Geoffroy)
- Front femur not stout, index above 4.5; other characters combined not as above 28
28. Ovipositor long, 0.61—0.67 (0.71, compare item 11) length of front wing. Front

- tibia somewhat inflated, index 5.0—6.0. Scutellum 2 black. Upper half of frons not concave, somewhat convex; lower frons (antennal scrobes) slightly concave. Propodeal spiracle very small, shortly elliptic. Propodeal carinae, Fig. 21. Small specimens, front wing about 4.5—5.8 mm . . . . . *C. minator* Grav.
- Ovipositor shorter, 0.48—0.62 length of front wing. Front tibia rather inflated, 4.5—5.0 (in *C. viduatorius*) or not inflated (in *C. diana*). Propodeal spiracle not very small or tending to circular . . . . . 29
29. Ovipositor 0.48—0.53 length of front wing, hence relatively short. Front tibia not inflated. Index of postanellus 5.8—7.0. Index front femur 4.7—5.2. Propodeal carinae as in Fig. 20. Gaster (except petiole) entirely ferruginous to bright orange. A boreal subspecies of *C. diana* . . . . . *C. diana obscuripes* Zett.
- Ovipositor 0.48—0.62 length of front wing. Front tibia rather inflated, index 4.5—5.5. Front femur relatively slender, index 4.4—5.4. Scutellum 2 always marked with ivory. Gaster fuscous to bright orange. Tip of ovipositor as in Pl. 1 Fig. 7. See item 22 . . . . . *C. viduatorius* Fabr.

## SYSTEMATIC PART

### *Cryptus italicus* Gravenhorst, 1829

*Cryptus italicus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 559, ♂ (no 96).

Characteristics of the lectotype of *C. italicus* Gravenhorst. Male, 7.8 mm. Labels: a white tag "m" (a syntype). Lectotype hereby designated and labelled accordingly. A second male specimen in Gravenhorst's collection is similar to the lectotype. I labelled it "paralectotype". Male, 10.8 mm.

Female. — Body length 9.6—10.0 mm. Front wing 6.8—7.8 mm. Head black. Antennae long and slender, reaching at least the 2nd gastral segment. Index of postanellus 4.2—5.0. Antennal segments 8—11 white dorsally. Labrum light brown. Labial palpi brown, maxillary palpi light brown. Clypeus well-defined, with scattered fine punctures, somewhat convex, with broad shiny anterior margin. Central part of face weakly convex, closely and finely punctured. Lateral parts somewhat sunken, giving the face a concave appearance. The sunken parts are pubescent with greyish adpressed hairs. Frons weakly concave, rugose, antennal scrobes polished, scarcely defined. Frontal orbits with yellow marking. Vertex with fine sculpture and greyish adpressed pubescence. OOL about 2 × diameter lateral ocellus. Compound eyes conspicuously convex, relatively small. Breadth face: breadth compound eye, 9 : 5. Outer orbits with yellow marking. Temple densely punctured, towards gena somewhat rugose. Occipital carina and especially genal part developed into a lamella. Hypostomal carina at posterior articulation of mandibula also developed into a lamella. Genal carina meeting hypostomal carina at a distance of about 0.66 of the mandibular breadth and an angle of 90° (Fig. 43).

Thorax black. Pleural part of pronotum with longitudinal ridges. Epomia present. Prescutal sutures shallow, barely reaching the central part of mesonotum. Mesonotum with fine, regular punctures, polished between. Episternum 2 roughly sculptured, epicnemial carina running up 0.55 the distance between sternalus and alar prominence. Sternalus strongly developed. Propodeum roughly sculptured, with both carinae complete and almost parallel. Space between carinae with strong longitudinal ridges. Propodeal spiracles large, index 2.5. Coxae vaguely rufous. Femora brownish to orange. All tibiae with conspicuous, adpressed short hairs, light grey in colour, giving the tibia a greyish appearance. Basi-

tarsus and following tarsal segments of middle and hind leg dorsally yellowish to whitish.

Gaster with petiole fuscous. Postpetiole brown, with posterior corners marked orange. First segment slender. Second tergite with dense, rather fine punctures. Rest of gaster orange, with posterior margin of tergites 6 and 7 whitish. Ovipositor long, about 0.54—0.57 length of front wing.

Male. — Body length, 9.2—11.0 mm. Front wing 7.0—7.2 mm. Head black. Inner and outer orbits marked with ivory. Labrum brown to ivory-white. Labial and maxillary palpi light brown. Clypeus well-defined, somewhat convex, with broad, flat anterior margin. Clypeus widely punctured. Face heavily and densely punctured. Central part of face weakly convex. Antennal scrobes vague, somewhat polished. Frons rugosely sculptured. Ocellar region somewhat convex. Vertex closely punctured, pubescent. OOL about 2 × diameter lateral ocellus, or slightly less. Temple and gena strongly punctured, polished and pubescent. Hypostomal carina at lower condyle of mandibula developed into a lamella; met by the genal carina at a distance of slightly less than the mandibular breadth and at a right angle. The lower gena is thus somewhat broadened.

Thorax black, roughly sculptured all over. Prescutal sutures shallow. Mesoscutum shiny, densely punctured. Epicnemial carina running up about 0.60 of the distance between sternaulus and subalar prominence. Propodeum with both transverse carinae well-developed, subparallel; connected by conspicuous longitudinal wrinkles. Legs with all coxae black. Trochanters dark brown. Front and middle femora with base fuscous. Hind femora with apical part ferruginous. Front and middle tibia and basitarsus white dorsally. Basitarsus and tarsal segments 2, 3 and 4 of hind leg mostly white.

Gaster with first segment black and very slender, reaching length of first four segments of flagellum. The position of the spiracles of tergite one conspicuous, at about 0.66 of length first segment. Rest of gaster orange.

Biology. — Bauer (1961) reports having found *C. italicus* in burrows of *Andrena* at Lenzenburg (Franken).

Material examined. — Algeria: ♂, Mazafran, 1.VI.1910, leg. J. Bequaert, coll. Habermehl (SM). France: ♀, Varagas (Var) (N 561), 9.V.1967, 340 m, leg. Simon Thomas (PD). Germany: ♂, Alsbach, 31.V.1909, coll. Habermehl (SM); ♀, Jena, 7.VII.1919, leg. R. Meyer, coll. Habermehl (SM). Italy: ♂, no data (the lectotype of *C. italicus* Grav.) (ZI); ♂, Bolzano, 1914, leg. Smits van Burgst (ELW); 3 ♀, Bolzano, 1913 & 1914, leg. Smits van Burgst (ELW). Tunisia: ♂, surroundings Tunis, IV.1911, leg. Smits van Burgst (ELW). Turkey: ♀, Kirat, vil. Zonguldak, 12.V.1951, leg. H. W. E. Croockewit (MA). No data: ♀, ex. coll. Schmiedeknecht (ELW).

### *Cryptus triguttatus* Gravenhorst, 1829

*Cryptus triguttatus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 528, ♂ (no 75).

*Cryptus spectator* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 529, ♂ (no 76) (Syn. nov.).

*Cryptus extinator* Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 124, ♂ ♀.

*Cryptus erro* Tschek, 1870b, Verh. zool.-bot. Ges. Wien 20: 407, ♀ (type not seen).

There are four specimens of *Cryptus triguttatus* in Gravenhorst's collection at Wrocław: two syntypes (unlabelled) and two other specimens with labels, probably added later. Gravenhorst mentions two specimens, from Austria and the Piedmont ("pedemontanum"), respectively.



Characteristics of the lectotype of *Cryptus triguttatus*. Male, 10.2 mm. Labels: none, lectotype hereby designated and labelled accordingly.

Head black. Palpi brown. Clypeus with broad, flat, anterior margin; shiny, with scattered punctures, convex. Face with weak central convexity, closely punctured. Antennae with tyloidea on segments 15—20. Frons rugose. Gena polished, with punctures separated by about their diameter. Inner and outer orbits marked with yellow.

Thorax black, roughly sculptured. Epomia present. Epicnemial suture obliterated at half the distance between sternaulus and subalar prominence. Both propodeal carinae present. Tegulae, subalar prominence and scutellum 2 yellow. Legs with all coxae dark rufous to black. Femora, front and middle tibiae yellow to rufous, tarsi brown. Tarsus of hind leg rufous brown.

Gaster orange, except petiole and apex. Tergite 2 with dense punctures.

A second male is similar. I labelled this paralectotype.

I refrain from giving full-length descriptions of the male and female of this species. The Gravenhorst lectotype is sufficiently typical for the male. Both sexes are easily identified if the puncturing of the second tergite is observed.

Some characters of the female. — Front wing 5.2—7.4 mm. Antennae with a white band; index of postanellus 4.3—5.0, relatively short. Thorax with most of the scutellum 2 ivory. Both propodeal transverse carinae well-developed. Legs with all coxae rufous. Front femur rather short and stout, index, 3.5—4.3. The hind femur stout, ferruginous. Gaster with dense, relatively (in comparison with other species) coarse punctures on tergite 2 (Fig. 24). Beyond tergite 3 the puncturing gradually blurs. Ovipositor about 0.40—0.45 length of front wing, with long tapering tip. Areola Fig. 16.

Some characters of the male. — Front wing 5.7—6.8 mm. Tyloidea on segments 15—20; 16—21; 16—22. Temple and gena coarsely punctured. Thorax black, scutellum 2 for the greater part ivory; tegulae and subalar prominence mostly ivory. Both propodeal carinae well-developed. Index of front femur 4.0; 4.2; 4.3. Entire hind leg fuscous ferruginous. Gaster with dense (setiferous) punctures on tergite 2, somewhat more difficult to observe than in the female. The angle of observation should be about 45°.

Characteristics of the holotype of *Cryptus spectator* Gravenhorst. Male, 10.2 mm. Labels: none; hereby designated and labelled accordingly. As I omitted to study the sculpture of the second tergite, I asked Dr. W. J. Pulawski to do this. He reported that the puncturing of the second tergite agrees with the lectotype of *C. triguttatus*. Schmiedeknecht (1930: 65) placed this Gravenhorst species as var. 5 with *C. diana*.

Pfankuch (1920: 38) synonymized *Cryptus triguttatus* Gravenhorst and *Cryptus extinator* Tschek. He investigated Gravenhorst's type material and seems to have known Tschek's species, though he did not mention whether he saw the type material. Habermehl (1930: 47) investigated Tschek's type material and bore out Pfankuch's conclusions.

Characteristics of the lectotype of *Cryptus extinator* Tschek. Female 10.1 mm. Front wing 6.5 mm. Labels: 13.5(18)69 (written); *Cr. extinator* m. (violet ink; "Type" in red ink) (same label) (Tschek's writing), Tschek 1872 Piesting (printed); *Cryptus triguttatus* Grav. ♀ = *extinator* Tschek, Habermehl det.; lectotype labelled accordingly.

Head damaged by clot of glue on face. Left antenna missing. Right antenna glued to face. The most conspicuous character is the dense and coarse puncturing of the postpetiole and tergite 2. Beyond tergite 2 the puncturing gradually blurs. Three other female specimens were labelled paralectotype.

Remark. — Tschek (1870b: 407) based *Cryptus erro* on one female from Tultscha.

The holotype of this species was investigated by Habermehl (1930: 47), who considered it to be no more than a form of *Cryptus triguttatus* Gravenhorst. As the holotype of *C. erro* was with Mr. J. F. Aubert during the time of my investigations, I did not study it. I have followed the conclusions of Habermehl.

Material examined. — Austria: ♀, Piesting, 13.V.1869, leg. Tschek, lectotype of *C. exstinctor* (NMW); ♀, Piesting, 2.VIII.1866, leg. Tschek, paralectotype of *C. exstinctor* (NMW); ♀, Piesting, 1.VIII.1869, leg. Tschek, paralectotype of *C. exstinctor* (NMW); ♀, Piesting, 29.IV.1869, leg. Tschek, paralectotype of *C. exstinctor* (NMW); ♀, Piesting, 1871, leg. Tschek (NMW); ♀, Piesting (?), 6.VII.1870, leg. Tschek (NMW); ♂, Piesting (?), leg. Tschek (NMW); ♂, Piesting (?), 10.VII.1870, leg. Tschek (NMW). Italy: 4 ♀, Brindisi, leg. Erber, coll. Tschek (NMW); ♂, Brindisi, leg. Erber, coll. Tschek (NMW). No data: 2 ♂, lectotype and paralectotype of *C. triguttatus* Gravenhorst, coll. Gravenhorst (ZI).

### *Cryptus spinosus* Gravenhorst, 1829

*Cryptus spinosus* Gravenhorst, 1829, Ichneumonologica Europaea 2 (2): 558—559, ♀ ♂ (no 95). *Ichneumon armatorius*; Fabricius, 1787, Mantissa Insectorum 1: 260 (name preocc. by Forster, 1771).

Fabricius' name for this species is preoccupied by Forster (1771)<sup>1</sup>) and Gravenhorst's *C. spinosus* is the next available. There are three specimens in Gravenhorst's collection at Wrocław.

Characteristics of the lectotype of *Cryptus spinosus*. Female of 8.8 mm. Labels: a white tag "f" (a syntype). Lectotype hereby labelled and designated.

Head black, inner and outer orbits marked with yellow, yellow spots in malar space. Clypeus shiny with scattered punctures. Face rugose with central convexity strong, having the shape of a blunt nose. Scapi dark rufous. Index of postanellus, 6.7. Antennal segments 7, 8 and 9 white dorsally, segment 10 spotted white. Antennal scrobes concave, with transverse wrinkles. Frons roughly rugose, somewhat concave.

Thorax black, tegulae, scutellum 2 and subalar prominence spotted yellow. Entire right side eaten by dermestids. Pronotum with strong epomia. Prescutal sutures broad, with strong transverse wrinkles. Entire thorax roughly rugose. Propodeum with area superomedial indicated. Posterior transverse carina with sublateral corners horn-like. Legs with all coxae and trochanters dark rufous, remainder of legs orange to brown. Tibia I slightly inflated.

Gaster with fine coriaceous sculpture.

Two other specimens without labels were marked paralectotype.

Description of the female. — Front wing 7.0—8.8 mm.

Head black. Specimens with the following ivory-yellow marking occur: mandibles, labrum, clypeus, malar space on mandibular base, inner and outer orbits, OOL-region on eye margin. Clypeus strongly convex. Facial convexity in some specimens strongly protruding. Face densely punctured, often with conspicuous suberect silvery hairs. Lower frons rather concave, polished, with transverse wrinkles. Upper frons roughly rugose. OOL : diameter posterior ocellus, 1 : 1. Postanellus slender, index, 6.3—7.0. Antennae with white band. Temple and gena with suberect silvery hairs, polished and regularly, rather widely punctured.

<sup>1</sup>) A species of *Amblyteles* (Ichneumoninae).

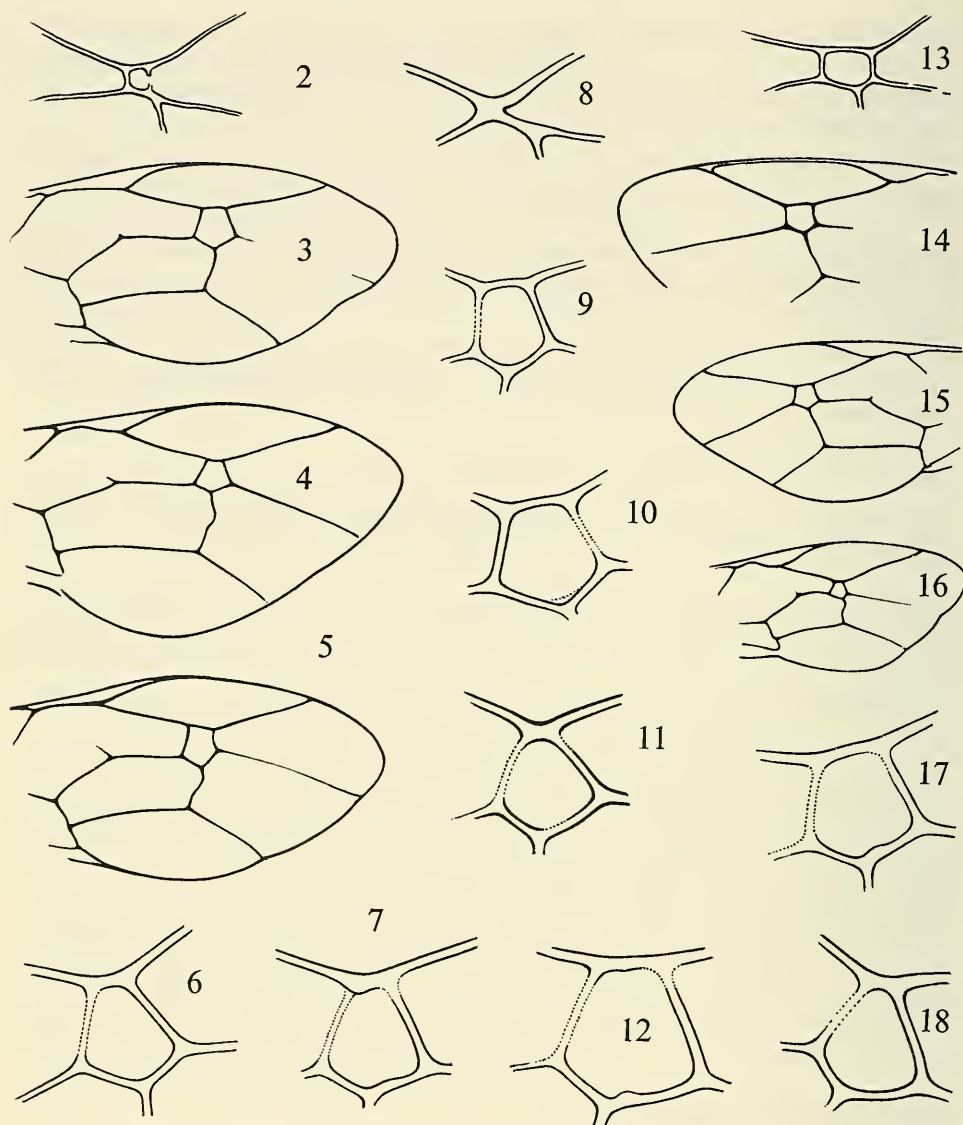


Fig. 2—18. Areolas of: 2, *Mesostenus gladiator* (Scop.), ♀, den Dolder (Netherl.), 6.VIII.1928, leg. Stärcke (PD); 3, *Synechocryptus bovei* (Brullé), ♂, Jordan, plains between Jericho and Dead Sea, 7.IV.1964, leg. Verhoeff (PD); 4, *C. lugubris* Grav., ♂, Clairmarais (France), coll. den Hoed; 5, *Synechocryptus mactator* (Tschek), ♂, Tunis, 1911, leg. Smits van Burgst (ELW); 6, *C. fibulatus* Grav., ♂, illegible label, 24.VIII.1880, coll. Dittrich (ZI); 7, *C. armator* F., ♀, Piesting, 30.VIII.1866, coll. Tschek (NMW); 8, *Mesostenus gladiator* (Scop.), ♂, den Dolder (Netherl.), 6.VIII.1928, leg. Stärcke (PD); 9, *C. apparitorius* (de Villers), ♂, paralectotype of *C. gratiosus* Tschek (NMW); 10, *C. luctuosus subquadratus* (Thoms.), ♂, Putten, 21.IV.1915 (MA); 11, *C. arcticus* Schiødte, ♀, holotype of *C. lutescens* Tschek (NMW); 12, *C. leucocheir* (Ratzeb.), ♀, Spijkenisse, 12.VIII.1909 (ELW); 13, *Mesostenus hellenicus* Schmiedeknecht, ♂, Carpentras (France), 1—3.VIII.1953, leg. Verhoeff (PD); 14, *Idiolispa analis* (Grav.), ♀, Ede (Netherl.), Sijsselt, 7.IX.1963, leg. van Rossem (PD); 15, *C. inculcator* (L.), ♂, Podkowa Lesna ad Warszawa, 4.VII.1956, leg. Glowacki; 16, *C. triguttatus* Grav., ♀, Piesting, 1871, coll. Tschek (NMW); 17, *C. bucculentus* Tschek, ♀, Tunis, IV.1911, leg. Smits van Burgst (ELW); 18, *C. spinosus* Grav., ♀, Valle di Toscolano, 10.V.1964, coll. van Ooststroom



Thorax black, roughly sculptured. The following parts may show ivory-yellow marking: anterior margin of notum 1, tegulae, subalar prominence, scutellum 2. Propodeum with indication of area superomedia. Both transverse carinae in most specimens complete (Fig. 39). Sublateral corners of posterior carina developed into strong, blunt horns (Fig. 39). Coxae and trochanters rufous to black. Femora dirty red to orange red, with base more often fuscous. Front and middle tibiae brownish, hind tibiae brownish to fuscous. Areola Fig. 18.

Gaster with petiole black to fuscous. Postpetiole and all tergites dirty red to orange. Tergite 2 and following tergites rather roughly coriaceous. Ovipositor 0.47—0.51 length of front wing. Tip of ovipositor as in Fig. 56.

Male. — Front wing 5.5—6.9 mm. Head black. Specimens with the following ivory-yellow marking occur: palpi, mandibles, labrum, clypeus, facial convexity (Y-shaped), scapi, inner and outer orbits. Head with conspicuous suberect silvery hairs. Antennal scrobes somewhat concave, polished. Upper half of frons not concave, rugose. OOL : diameter posterior ocellus, about 1 : 1.

Thorax black, roughly sculptured. The following parts may show ivory-yellow marking: anterior margin of notum 1, tegulae, subalar prominence, scutellum 2, coxae and first trochanter of fore leg, segments 2, 3 and 4 of hind tarsus. Further coloration of the legs as in the female. Middle and hind tibiae very slender, both reaching the length of corresponding femur + second trochanter. Propodeum with both transverse carinae well developed, with indication of an area superomedia. Sublateral corners of posterior transverse carina developed into strong dentation (Fig. 40) which may be lacking in certain specimens. Thorax covered with erect to suberect silvery hairs.

Gaster with petiole black, postpetiole and following tergites orange.

Material examined. — Algeria (?): ♀, Hamman bou Hadjar, IV.1910, leg. Schmiedeknecht, ex coll. Weis, coll. Habermehl (SM). Germany: ♀, Crefeld, 6.V, leg. Ulbricht, coll. Lindemans (MR). Greece: ♀, Gardiki Om, 1000—1200 m, 38.50 N—21.58 E, 1—4.VIII.1963 (RMNH). Italy: ♂ ♀, Bolzano, VI.1913, leg. Smits van Burgst (ELW); ♀, Valle di Toscolano (Lago di Garda), 10.V.1964, coll. S. J. van Ooststroom; ♀, Syracuse, 1907, leg. Schmiedeknecht, ex coll. Weis, coll. Habermehl (SM); ♀, Syracuse, IV.1921, leg. Trautmann, coll. Habermehl (SM); ♀, Valle de Ordesa, VII.1923, leg. Seitz, coll. Habermehl (SM). Netherlands: ♀, Venlo, 2.VI.1936, coll. Lindemans (MR). Spain: 2 ♂, Barcelona, 12.IV.1924, leg. M. Marten, coll. Habermehl (SM). Sweden: ♀, Ilsp (= Ilstorp), Skåne, coll. Thomson (ML, no 17/1968); ♂, Pål (= Pålshö), Skåne, coll. Thomson (ML, no 18/1968). Tunis: ♂, Tunis, 1906, leg. Schmiedeknecht, ex coll. Weis, coll. Habermehl (SM). U.S.S.R.: ♀, Ural (?), 8.VII.1909, leg. Becker, coll. Dittrich (ZI). No locality: ♀, the lectotype of *C. spinosus* Grav., coll. Gravenhorst (ZI); ♀, no data, leg. Marten S., coll. Habermehl (SM).

### *Cryptus immitis* Tschek, 1870

*Cryptus immitis* Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 118, ♀ (no 6) (type lost).  
*Cryptus disjunctus* Tosquinet, 1896, Mém. Soc. ent. Belg. 5: 138—140, ♀ (no 6).

The holotype of *Cryptus immitis* Tschek is not in the Vienna Museum and I consider it to be lost. Habermehl (1930) who reported on the Tschek collection does not mention it. Strobl (1900) wrote of buying material from Tschek's heirs<sup>1</sup>), but Dr. Günther

<sup>1</sup>) I suppose that this point has been overlooked by other authors.

Morge, who is in charge of the Strobl material, kindly informed me that there is no original material of *C. immitis* of Tschek in Strobl's collection at Admont (Austria). Nevertheless there is an interpretation of authors of this species going back to Schmiedeknecht (1890). I think this is reason enough to retain Tschek's name with simultaneous indication of a neotype.

Further it appears that the species described by Tosquinet in 1896 as *Cryptus disjunctus* is identical with *Cryptus immitis* Tschek sensu auctorum. The holotype of Tosquinet's species belongs to the Zoologisches Museum in Berlin and this specimen could well serve as the neotype of *Cryptus immitis* selected in order to prevent all future doubt about the identity of Tschek's species. A brief description of this specimen follows.

Characteristics of the holotype of *Cryptus disjunctus* Tosquinet. Female, 8.5 mm. Front wing 7.3 mm. Labels: an orange tag printed "Type"; a red-rimmed white tag written "type"; a blue tag printed "Blidah-Médéah, Algerien Juli-August 84 Quedenfeldt"; a white tag written "Cryptus disjunctus Tosquinet. No. 26350". Holotype labelled accordingly. Neotype of *Cryptus immitis* Tschek hereby designated.

Head black, inner and outer orbits with ivory lining. Face with adpressed silvery hairs. Antennal scrobes weakly concave, upper frons not concave, rugose. OOL : diameter lateral ocellus, 8 : 7. Index postanellus, 7.2 (slender). Antennal segments 7—9 white dorsally. Thorax black, posterior margin of notum with two yellow spots. Areola with strongly converging sides, anterior side narrow. Front tibia somewhat inflated. Hind femur fuscous-ferruginous. Gaster with close alutaceous sculpture, dirty reddish, apex fuscous. Ovipositor long, 5.4 mm; 0.63 of front wing. Both ovipositor valves with long tapering tip (Fig. 55).

Description of the female. — Length of front wing 7.3—7.5 mm. Head black, inner and outer orbits with ivory lining. Clypeus strongly convex, anterior margin broad, polished, somewhat expanded medially. Upper part of clypeus and entire face closely punctured, with silvery, adpressed hairs. Lower frons weakly concave; upper frons rugose. OOL : diameter lateral ocellus, 8 : 7, 1 : 1. Postanellus slender, index 6.0—7.6. Antenna with white band.

Thorax black, ivory marking may occur on anterior and posterior margin of notum 1, tegulae, scutellum 2. Epomia in most specimens weak. Mesoscutum and scutellum 2 polished, mesoscutum finely punctured, scutellum 2 more widely and in some specimens more roughly punctured. Propodeum roughly rugose, both carinae in most specimens strong, an area superomedia very often indicated (Fig. 29). Sublateral corners of the posterior carina strongly dentated. Propodeal spiracle small, elliptic. Wings somewhat infusate; areola with cubital cross veins strongly converging, anterior side thus narrow. Nervulus (cua) rather conspicuously ante-furcal. In the hind wing the angle between the medial vein (M+Cu1) and the nervellus (Cu1+cua) rectangular. Indices of femora; 4.7—5.1 (1); 5.6—6.0 (2); 5.4—5.7 (3). A specimen from Bolzano (Italy) has the hind femora bright orange; in Spanish material the hind femur is fuscous.

Gaster with petiole fuscous and following tergites orange-red. In Spanish material the entire first segment is black. Tergite 2 and 3 with fine, granulated alutaceous microsculpture; further tergites have this character less pronounced. Ovipositor long, about 5.5 mm; 0.63—0.73 length of front wing (Fig. 55).

Remark. — A female from Mascara (Algeria) in Habermehl's collection at Frankfurt (Main) disagrees in some respects with European material of *C. immitis*: ovipositor relatively longer, 0.87 length of front wing and slightly curved; the distance between the

notch and apex of the dorsal valve is slightly larger. The sculpture of tergite 2 is finely alutaceous, not granulated.

It is difficult to say exactly what this specimen represents, since it occurs in the same region as the normal form. For the present I prefer to characterize it as *Cryptus immitis* forma *perinsignis*<sup>1)</sup> nov. No SMF: H 1629.

Male. — Up to now the male of this species has not been described. I have encountered a single specimen, which has certain characters in common with the female. The difficulty with this specimen is, that it was collected in the same place as the above-mentioned disagreeing female specimen, but since I have been unable to find other males, a brief description of this one follows.

Front wing 6.3 mm. Head black, inner and outer orbits marked yellow. Face regularly and closely punctured. Face, frons, vertex, temple and gena with erect, grey pilosity, reaching about the width of OOL on temple. Frons not concave; rugose. OOL : diameter lateral ocellus, 8 : 6. Tyloidea small and difficult to see, on antennal segments 15—19.

Thorax black. Mesoscutum and scutellum 2 polished, with close regular puncturing as in the female. Pleural parts and propodeum with rough sculpture. Wings slightly infuscate. Areola with cubital cross veins strongly converging, thus anterior side narrow. Nervulus ante-furcal. In the hind wing the angle between the medial vein (M+Cu1) and the nervellus (Cu1+ cua) rectangular. Indices of femora: 4.8 (1); 6.0 (2); 5.8 (3). All coxae and trochanters fuscous to black. Front femur with apex light brown; middle and hind femur fuscous to black. Hind tarsus with segments 3 and 4 white, others black. Propodeum with anterior carina obliterated; posterior carina with rather strong sublateral dentation.

Gaster with first segment black; tergite 2 dorsally fuscous, sublaterally reddish; tergites 3 and 4 dirty red, following tergites fuscous-ferruginous.

Material examined. — Algeria: ♀, Blidah-Médéah, VII-VIII.1884, leg. Quedenfeldt (ZM, no. 26350) (holotype of *C. disjunctus* Tosq.); ♀, Mascara, 12.V.1910, leg. J. Bequaert (coll. Habermehl) (SM) (f. *perinsignis*); ♂, Mascara, 8.V.1910, leg. J. Bequaert (coll. Habermehl) (SM). Germany: ♀, Iggelbach, 16.VI.1910, leg. Habermehl (SM); 5 ♀, Murr, Württbg., leg. Habermehl (SM); 2 ♀, Bürgst (W), V.1905, leg. Habermehl (SM). Italy: ♀, Bolzano, VI.1913, leg. et coll. Smit van Burgst (ELW). Spain: ♀, Zapardiel de la Ribera (Avila), 900 m, 23.VI.1961, on *Thapsia villosa* L., exc. RMNH (RMNH); ♀, la Aliseda (Avila), 900 m, 23.VI.1961, exc. RMNH (RMNH); 2 ♀, la Aliseda (Avila), 900 m, 23.VI.1961, on *Thapsia villosa* L., exc. RMNH (RMNH). Switzerland: ♀, Savognin, 17.VI.1910, leg. Weis, coll. Habermehl (SM).

### *Cryptus minator* Gravenhorst, 1829

*Cryptus minator* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 556—558, ♀ ♂ (no 94).  
*Cryptus minator* Gravenhorst, 1829, Ichneumonologia Europaea 1: 704 (Supplementa, partis 2), ♂.

The first description of this species appeared in the second part of Gravenhorst's Ichneumonologia and not, as De Dalla Torre (1901—1902: 579) wrongly stated, in part one. This author overlooked that the males mentioned on p. 704 were only an

<sup>1)</sup> Meaning: very remarkable.



addition to the original description on p. 557 of part 2. The "supplementa" are sometimes bound with part one.

*Cryptus minator* remains a rather mysterious species; it is certain that a good number of specimens in collections do not belong to what Gravenhorst described as *C. minator*. Part of the wrongly identified material are small, atypical specimens of *C. diana*. The remaining few specimens which really are identical with Gravenhorst's material nevertheless do not form a very convincing unit. It could turn out later that what Gravenhorst described as the *C. minator* female is only a small variant of this species. I have included the *C. minator* female as a good species but have not succeeded in finding a good male. For this reason I have inserted a tentative outline of the male characters in my key (compare item 26) but not given a full description.

Two varieties of this species have been described: *C. minator* var. *bulgaricus* Gregor, 1933 (♀ ?) and *C. minator* f. *nigricans* Habermehl, 1929 (♂), but in view of the facts neither is very convincing. I have not seen the types.

Characteristics of the lectotype of *Cryptus minator* Gravenhorst. Female, 8.3 mm. Labels: a white tag "f" (a syntype). Lectotype hereby designated and labelled accordingly. Head black with a tendency to rufous, inner and outer orbits with whitish markings. Clypeus strongly convex, rufous, polished, with scattered punctures. Face rather pubescent. Antennal scrobes somewhat concave, with transverse ridges. Frons roughly sculptured. Temple and gena polished, with widely placed punctures, pubescent. Antennae rufous, index of postanellus, 6.0. Antennal segments 7, 8, 9 and partly 10, white dorsally. Thorax black to rufous. Propodeum with both transverse carinae present. Gaster with petiole dark red, following tergites orange. Tergites finely coriaceous. Length of ovipositor, 0.61 length of front wing.

Description of the female. — Body length 6.0—9.5 mm. Front wing 4.6—6.4 mm. Head rufous to black, inner and outer orbits with ivory-yellow marking. Lower frons shallowly to moderately concave with transverse wrinkles. Upper half of frons not concave and not declivous before the medial ocellus, weakly to more strongly rugose. OOL : diameter lateral ocellus, 7 : 5; 6 : 5. OOL definitely wider. Index of postanellus, 5.2—6.7 (slender). Antennal segments 6, 7, 8, 9 and 10 partly or entirely white.

Thorax rufous to black. Epomia relatively strong. Propodeal spiracle small, elliptic to shortly elliptic. Propodeal transverse carinae variable in development; in some specimens both are present, but in others the anterior is rather obliterated. The arrangement of the carinae is shown in Fig. 21. Wings hyaline to rather infusate. Areola with cubital cross veins strongly converging (Pl. 1 Fig. 10). Indices of femora: 4.5—4.9 (1); 4.5—5.2 (2); 4.8—5.0 (3). All femora yellowish orange to bright orange. Front tibia somewhat inflated.

Gaster with petiole dark red to fuscous, following tergites bright orange to somewhat dirty reddish. Ovipositor long, but variable in length, 0.61—0.71 length of front wing.

Male. — Not known with certainty (see introductory remarks).

Biology. — Schmiedeknecht (1931: 67) mentioned that Ratzeburg bred this species from *Hylotrupes bajulus* (Linné, 1758). If this very common cerambycid were the principal host, the parasite would have been more common. Either there is another host, of which the parasite has not been associated with *C. minator*, or the data of Ratzeburg are wrong.

Material studied. — Austria: ♀, Carinthia, Ebene Reichenau, 1095 m, 9.VIII.1964, leg. G. van Rossem (PD). Italy: ♀, Bolzano, VI.1913, leg. et coll. Smits van Burgst

(ELW); ♂, Prati dei Monti, 1600—1700 m, Funes, prov. Bolzano, 20.VII—9.VIII.1968, leg. G. van Rossem (PD) (dubious specimen); ♀, Syracuse, 1907, leg. Schmiedeknecht, coll. Habermehl (SM). No locality: ♀, the Gravenhorst lectotype (ZI); ♀, label illegible, 1.VIII.1909, coll. Dittrich (ZI).

### *Cryptus arenicola* Thomson, 1873

*Cryptus arenicola* Thomson, 1873, Opuscula entomologica 5: 484, ♀ ♂ (no 14).

According to information received from Mr. H. Andersson, there are eight syntypes in the Thomson collection in Lund. One of these, a female, was kindly sent to me. I have selected this as the lectotype and a description follows.

Characteristics of the lectotype of *Cryptus arenicola* Thomson. Female, 8.7 mm. Front wing about 6.0 mm (badly damaged). Labels: a small white tag "Ilsp 6/7" (= Ilstorp, Skåne, Sweden; the type locality); a red-rimmed box label "*arenicola*" (written); no 10/1968; lectotype hereby designated and labelled accordingly.

Head black, the following parts with ivory-yellow marking: malar space, inner and outer orbits. Palpi and labrum brown. Clypeal and facial convexity well-shown. Face closely punctured, with short adpressed hairs. Concavity of lower frons slight, upper frons not concave. Entire frons rugose. OOL : diameter lateral ocellus, 9 : 6. OOL wide. Antennae somewhat rufous, segments 7—10 white dorsally. Index of postanellus, 5.0. Temple and gena densely punctured, but shiny.

Thorax black, anterior part of notum 1 somewhat rufous. Epomia strong. Mesoscutum finely and densely punctured, polished between. Scutellum 2 polished with some rather scattered punctures. Propodeum entirely rugose. Both transverse carinae almost obsolescent, only sublateral corners of posterior carina indicated. Propodeal spiracle elliptic. Pleural part of thorax densely sculptured. Wings hyaline; apical parts lost in the lectotype. Areola small, with converging sides. Legs with all coxae and trochanters rufous. All femora bright orange. Front and middle tibiae and tarsi, respectively, yellowish to light brownish. Apical part of hind tibia and tarsus brown. The most conspicuous character of this species is the index of the hind femur, 4.2; short and stout.

Gaster with entire first segment black. Tergites 2 and 3 orange. Apical margin of tergite 4 and following apical tergites somewhat fuscous to rufous. Sculpture of the gaster finely alutaceous, including the postpetiole. Ovipositor 2.7 mm long. The index with the length of the front wing could not be calculated sharply, but it should be about 0.45 of the length of front wing.

Male. — I have found only one male. A description of this specimen is included tentatively. Body length, 10.0 mm. Front wing, 6.5 mm.

Head black, the following parts with ivory marking: mandibles, labrum, clypeus, central convexity, inner orbits broad, malar space reaching mandibular base, outer orbits. Palpi brown. Face, clypeus, temple and gena with conspicuous silvery adpressed to suberect hairs. Face with dense sculpture. Lower frons slightly concave; upper frons not concave. Entire frons rugose. OOL : diameter lateral ocellus, 11 : 6. Antenna with tyloidea on segments 16—23. Temple and gena densely punctured, polished between.

Thorax black, yellow spots on scutellum 2 and subalar prominence. Epomia strong. Sculpture of the thorax not differing from the female. Propodeum with the anterior carina indicated; the posterior obsolescent, but sublateral corners present as weak teeth, in agreement with the female. Propodeal spiracle elliptic. Wings subhyaline; areola with

converging sides. Legs with coxae and trochanters fuscous to somewhat rufous. Front and middle trochanters marked with ivory. Front and middle legs beyond the trochanters and the hind femora bright orange. Hind tibia with apex fuscous. Hind basitarsus and second segment fuscous, third segment whitish; apices missing. Hind femur short and stout, index 4.2 (closely agreeing with the female).

Gaster with petiole fuscous-ferruginous; postpetiole and tergites 2, 3 and 4 orange, apex fuscous. Tergite 2 is indistinctly but densely punctured.

Material examined. — Netherlands: ♂, Den Haag, IX.1910, leg. et coll. Smits van Burgst (ELW). Sweden: ♀, Ilstorp, Skåne, 6.VII, leg. et coll. Thomson (the lectotype of *C. arenicola*) (ML).

### *Cryptus viduatorius* Fabricius, 1804

*Cryptus viduatorius* Fabricius, 1804, Systema Piezatorum: 70, ♀ (no 2).

*Cryptus germari* Taschenberg, 1865, Zeitschr. ges. Naturwiss. 20: 83, ♀ (no. 43).

*C. viduatorius* represents a rather general example of the genus, hence Curtis' (1837) early designation of this species as the type of the genus was just good luck. Also, *C. viduatorius* is one of the more common species of *Cryptus* in the Palearctic Region. In most collections there is at least some material of this species, in contrast with the paucity of other species. In the field it may be met on flowers of *Daucus carota* (Hassan, 1967) and some lepidopterous hosts are mentioned by Townes (1965).

*C. viduatorius* is a variable species and is thus difficult to key. For this reason I have inserted the female under two items in the key. The orange form is easily mistaken for some other species.

Characteristics of the lectotype of *Cryptus viduatorius*. Female, 7.6 mm. Front wing 5.3 mm. Labels: "*viduatorius*" in Fabricius' writing. "*Cryptus viduatorius* F. 1966 det. Horstm.", a white label. Lectotype hereby designated and labelled accordingly. Right front tibia, index 4.6. Right front femur, index 5.2. Length of ovipositor, 2.9 mm.

Female. — Body length 6.0—10.0 mm. Length of front wing 4.4—7.5 mm. Head black to ferruginous, inner and outer orbits with ivory marking. A light spot in malar space towards upper mandibular condyle. Facial convexity well-developed. Face with adpressed grey pilosity. Lower half of frons rather concave, subpolished with transverse wrinkling. Upper half of frons rugose. OOL wider than diameter of lateral ocellus, 9/8/5 : 6/5/4, respectively. Index of postanellus, 4.5—6.5. Gena broad. Temple and gena polished, with regularly placed, fine, setiferous punctures.

Thorax black to almost completely ferruginous. The following ivory marking may occur: anterior margin of notum 1, posterior margin of notum 1 with spots on dorsal apex of epomia, tegulae, scutellum 2 with a large square covering most of it (as far as I can judge, the marking of scutellum 2 is fairly constant), subalar prominence. Sculpture of thorax to relatively rough in small specimens (except for mesonotum and scutellum 2). Wings rather infusate to hyaline. Anterior side of areola narrow (Fig. 23). Propodeum with both transverse carinae. Legs with front femur slender (index 4.4—5.4), front tibia rather conspicuously inflated, index 4.5—5.5. Index hind femur 4.7—5.3. Coxae ferruginous to black. In most specimens all femora orange.

Gaster variable in colour; ranging from almost completely orange to black; if black then apical margins of tergites usually ferruginous. Tergites with a regular alutaceous sculpture. Ovipositor 0.48—0.62 length of front wing; tip rather characteristic, Pl. 1 Fig. 7.



Male. — The male of *C. viduatorius* is very difficult to identify when some of the rather relative colour characters are left out of consideration. Confusion with *C. spiralis* is to be expected. This can be avoided with the help of two characters. (1). The rather slender front femur of *C. viduatorius* compared with the stouter front femur in *C. spiralis*. (2). The lowest tyloidea in *C. viduatorius* occur on the antennal segment 16; in *C. spiralis* the lowest position is the 14th or 15th segment.

Head black, richly marked with ivory: palpi, mandibles, labrum, clypeus, inner facial orbits (broad), malar space, central part of face, frontal orbit, outer orbits, scapi. Face with silvery pilosity. Temple and gena polished, with regularly placed, fine setiferous punctures. OOL : diameter lateral ocellus, 9 : 6; 8 : 6; 7 : 5. Tyloidea on antennal segments 16/17—21/22/23. Frons rugose.

Thorax black. The following parts may show ivory marking: anterior and posterior margin of notum 1, tegulae, subalar prominence, scutellum 2, front and middle coxae and trochanters, segments 2, 3 and 4 of the hind tarsus dirty brownish white (the latter character is rather constant). Index front femur, 4.5—5.2. Index hind femur, 5.0—5.2. Propodeum with both transverse carinae. All femora, front and middle tibiae, orange yellow. Apex of hind tibia fuscous.

Gaster fuscous, apical margins of tergites often ferruginous. Tergite 2 and following tergites with dense, alutaceous microsculpture and adpressed dense setae.

Remark. — Taschenberg (1865) described *Cryptus germari*. I have not seen his type material, and I realized only after returning from Wrocław, that Taschenberg's specimen must be among the material of *C. apparitorius* Gravenhorst in Gravenhorst's collection. However, Aubert (1958) synonymized it as a form of *C. viduatorius* with the gaster partly or wholly orange. I follow Aubert in this respect as I agree with him that the material in collections under *C. germari* is always identical with *C. viduatorius*. This colour variation regularly occurs in populations of *C. viduatorius* and it can best be classified as: *C. viduatorius* f. *germari* Taschenberg, 1865.

Material studied. — Austria: ♂, Graz, 5.VIII.1880 (coll. Dittrich) (ZI). England: ♀, no locality, 1949, coll. Betrem. France: 2 ♀, Forêt de Campet, 120 m, L. et G. (D8), 17—22.VIII.1966, leg. R. T. Simon Thomas (PD); ♀, Carpentras (Vaucluse), VII.1953, leg. P. M. F. Verhoeff (PD). Germany: ♀, f. *germari*, Wartha, 23.VII.1911 (coll. Dittrich) (ZI); ♀, f. *germari*, Wernersd., 9.VIII.1893 (coll. Dittrich) (ZI); ♀ f. *germari*, Kleinbg., 30.VII.1888 (coll. Dittrich) (ZI); ♀, f. *germari*, label illegible, 28.VIII.1902 (coll. Dittrich) (ZI); ♀, f. *germari*, label illegible, 26.VIII.1879 (coll. Dittrich) (ZI); ♀, label illegible, 1.VIII.1905 (coll. Dittrich) (ZI); ♀, Carlowitz, 12.VIII.1883 (coll. Dittrich) (ZI); ♂, Schebitz, 7.V.1882 (coll. Dittrich) (ZI); ♂, Waldenbg (coll. Dittrich) (ZI); ♂, label illegible, no 267 (coll. Dittrich) (ZI); ♂, label illegible, 30.VII.1905 (coll. Dittrich) (ZI). Greece: ♀, Gardiki Om, 1000—1200 m, 38.50 N—21.58 E, 1.IV.1963 (RMNH). Jugoslavia: ♀, Srbija, Zahac, 9 km east of Pec, 15.VIII.1965, leg. Exc. Zool. Mus. (MA). Netherlands: ♀, f. *germari*, de Treek (U), 4.VI.1950, leg. H. Wiering (coll. den Hoed); ♀, Wolfheze, 3—20.VIII.1948 (coll. G. Barendrecht); ♀, Deventer (window), 8.VI.1949, coll. Betrem; ♀, f. *germari*, Rhenen, 22.VIII.1936 (coll. Koornneef) (ELW); ♀, Rhenen, 25.VII.1933 (coll. Koornneef) (ELW); ♀, Rhenen, 25.VIII.1933 (coll. Koornneef) (ELW); ♀, Rhenen, 17.VII.1936 (coll. Koornneef) (ELW); ♀, Rhenen, 20.VII.1936 (coll. Koornneef) (ELW); 2 ♀, Rhenen, 23.VII.1936 (coll. Koornneef) (ELW); 9 ♀, Rhenen, resp. 2, 4, 6, 8, 12, 14, 16, 26, 28.VIII.1936 (coll. Koornneef) (ELW). Poland: ♀, Ndt Lobodno p. Czesto-

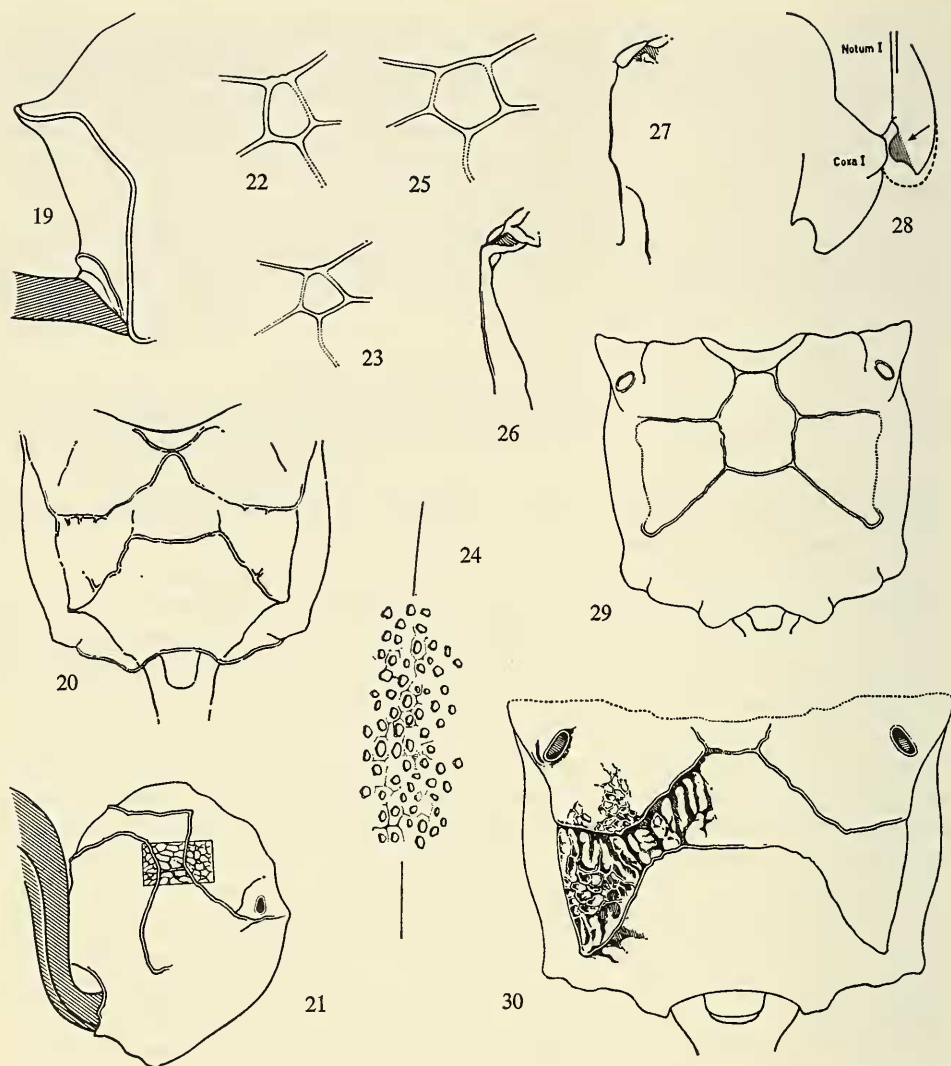


Fig. 19. *C. subspinosus* Smits van Burgst, ♀, St. Cloud-Oran, Algeria, coll. Habermehl (SM), right lateral view of propodeum showing left sublateral corner of transverse carina. Fig. 20. *C. diana obscuripes* Zett., ♀, Lapland, coll. Thomson (no 9/1968, ML), pattern of propodeal transverse carinae. Fig. 21. *C. minor* Grav., ♀, Ebene Reichenau, Austria (PD), propodeum in dorsolateral view from the right showing pattern of transverse carinae and detail of sculpture. Fig. 22—23, areolas of: 22, *C. moschator* (F.), ♀, Roseng., 20.X.1893, leg. Habermehl (SM); 23, *C. viduatorius* F., ♀, Zahac, 9 km e. of Pec, 15.VIII.1965, Jugoslavia (MA). Fig. 24. *C. triguttatus* Grav., ♀, no data, coll. Tschek (NMW), sculpture of part of tergite 2; line = length axis. Fig. 25. *C. inculcator* (L.), ♀, Podkowa Lesna p. Warszawa, VII.1952, leg. Glowacki, areola. Fig. 26—27, epicnemial carina of: 26, *Idiolispa analis* (Grav.), ♂, Ede (Netherl.), Sijsselt, 5.VIII.1965, leg. van Rossem (PD); 27, *Trychosia legator* (Thunb.), ♀, Ostkarawanken, Ebriach, Austria, 580—750 m, 21—29.VII.1964, leg. van Rossem (PD). Fig. 28. *Trychosia tristator* (Tschek), ♀, anterior part of epicnemeum, tooth-like structure indicated by arrow; schematic. Fig. 29. *C. immitis* Tschek, ♀, Spain, la Aliseda, 23.VI. 1961 (RMNH), dorsal view of propodeum with pattern of transverse carinae. Fig. 30. *C. diana* Grav., ♀, Rhenen, 17.VIII.1936, coll. Koornneef (ELW), dorsal aspect of propodeum with pattern of transverse carinae and some sculpture

chowa, 15.V.1949, coll. J. Glowacki; 5 ♀, Podkowa Lesna ad Warszawa, resp. 3.VIII. 1952, VII.1960, VIII.1960, coll. J. Glowacki. No locality: ♀ ♂, coll. Schmiedeknecht (ELW).

### *Cryptus moschator* (Fabricius, 1787)

*Ichneumon moschator* Fabricius, 1787, Mantissa Insectorum 1: 266 (no 84) ♂, Hafniae.

*Cryptus moschator* (Fabricius) is holarctic (Townes, 1962: 223). This author distinguishes two subspecies, the palearctic and the nearctic, respectively, *C. moschator moschator* and *C. moschator iroquois* (Viereck, 1917).

This species is rather difficult to key and there is not much material available in collections. It seems to occur in rather scattered places and probably has lepidopterous hosts. The species shows relationship with *C. viduatorius*.

Characteristics of the lectotype of *Ichneumon moschator* Fabricius. Male, 11.3 mm. Front wing 8.0 mm. Labels: "*moschator*" (in Fabricius' writing); lectotype hereby designated and labelled accordingly. A dirty specimen.

Head black, inner and outer orbits marked ivory. Tyloidea on antennal segments 18—22.

Thorax black, ivory spot on scutellum 2. All femora orange, front and middle tibiae orange. Hind tibia and basitarsus fuscous, segments 2, 3 and 4 of hind tarsus white. Areola relatively small, front side about 0.5 of outer converging side. Sides rather strongly converging. Index of propodeal spiracle, 2.0. Propodeum roughly sculptured, posterior carina well-developed, sublaterally crested.

Gaster dark brown to black. Apical margin of tergites 2 and 3 somewhat rufous.

### *Cryptus moschator moschator* (Fabricius)

Female. — Front wing 7.0—7.3 mm. Head black to ferruginous, ivory-yellow marking on outer orbits and spot on eye margin in OOL region. Antennae rather stout, fuscous to light brown. Index of postantellus, 4.4—5.1. Lower half of frons shallowly concave; antennal scrobes highly polished, sharply bounded. Upper half of frons rugose to weakly rugose. OOL narrow. OOL : diameter lateral ocellus, 1 : 1 (or OOL slightly less). Temple and gena polished, regularly and rather widely punctured to almost polished with very vague punctures.

Thorax black to ferruginous. Epomia present. Mesoscutum and scutellum 2 regularly punctured, polished between. Propodeum rugose, anterior carina obliterated, posterior carina complete, sublaterally crested. Propodeal spiracle shortly elliptic. Episternum 2 wrinkled. Speculum polished. Legs with all coxae fuscous to ferruginous. All femora, front and middle tibiae and tarsi bright orange. Hind tibia and tarsus fuscous to light brown. All femora comparatively stout. Index front femur, 3.7—4.2. Index hind femur, 4.7—5.1. Front tibia slightly inflated. Wings: areola with definitely converging sides, Fig. 22.

Gaster black to almost brownish-ferruginous. Hind margin of tergite 1 in some specimens with a slight yellow streak. All tergites finely alutaceous. Ovipositor variable in length (a remarkable character), 0.45—0.60 length of front wing.

Male. — Front wing 7.2—8.0 mm. Head black, inner and outer orbits marked with yellow, a spot in OOL region. Temple, gena and face with rather dense grey pilosity.



Antennae with tyloidea on segments 17—21 (22), scrobes polished, sharply bounded, shallowly concave. Upper half of frons rugose. OOL slightly wider than diameter lateral ocellus, 7 : 6, 9 : 7, 8 : 7.

Thorax black, scutellum 2 marked with ivory in some specimens. Sculpture as in the female. Propodeum with anterior carina wholly or partly obliterated, posterior carina complete, conspicuous, raised, with sublateral corners rather strongly dentated, but not rising very much above the level of the crest. A remarkable character is the more or less complete lateral longitudinal carina (Fig. 36). Legs as in the female. Femora somewhat more slender. Basitarsus of hind leg fuscous with white spot at apex. Tarsal segments 2, 3 and 4 of hind leg white. Wings conform to female.

Gaster fuscous to somewhat brownish-ferruginous.

Material examined. — Germany: ♂, Krietern, 17.V.1885, coll. Dittrich (ZI); ♂, Worms, 27.VI.1900, coll. Habermehl (SM); ♂, Hh.b.W., IV.1902, coll. Habermehl (SM); ♂, Neuh.b.W., 27.VIII.1891, coll. Habermehl (SM); ♀, Roseng., 20.X.1893, coll. Habermehl (SM); ♀, Neuh.b.W., 25.VIII. 1891, coll. Habermehl (SM); ♀, Worms, 27.VIII.1918, coll. Habermehl (SM); ♀, Worms, 3.VIII.1900, coll. Habermehl (SM). Netherlands: ♀, Valkenburg (?), 16.VII.1922, coll. Koornneef (ELW); ♀, Deventer, 4.X.1953, on window, coll. Betrem. Poland: ♂, Podkowa Lesna p. Warszawa, 25.IX.1952, coll. J. Głowacki.

### *Cryptus tuberculatus* Gravenhorst, 1829

*Cryptus tuberculatus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 501, ♀ (no 53).

*Cryptus investigator* Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 123, ♂ ♀ (no 11).

Two essential characters of the female of *C. tuberculatus* are (a) the very short ovipositor and (b) the conspicuously inflated front tibia. The latter character does not look impressive on paper, but shows well in actual comparison.

Gravenhorst mentions two specimens, but there is only one in the collection at Wrocław, which is thus the lectotype.

Characteristics of the lectotype of *Cryptus tuberculatus*. Female, 9.3 mm. Labels: none. Lectotype hereby designated and labelled accordingly.

Head black. Antennae slender, rufous. Index of postanellus, 5.5. Antennal segments 7—11 whitish. Labial and maxillary palpi brown. Clypeus weakly convex. Central convexity of face indicated. Face closely punctured. Lower half of frons concave, with close transverse ridges. Upper half of frons rugose. Gena polished, with fine punctures. Inner and outer orbits marked with yellow.

Thorax black. Two yellow spots on notum 1 opposite the base of the prescutal sutures. Tegulae yellow. Scutellum 2 with yellow marking. Subalar prominence with yellow spot. Prescutal sutures well-developed. Mesoscutum polished, with regular fine punctures. Episternum 2 rugose. Propodeum rugose, posterior transverse carina complete, sublaterally developed into somewhat lamelliform teeth. Legs with all coxae and trochanters black. Other parts of legs orange to rufous; hind tibia brownish. Front tibia strongly inflated, index 4.3 (Fig. 37).

Gaster orange-red, with close coriaceous microsculpture. Ovipositor short, 0.28 length of front wing.

Some characters of the female. — Body length 6.5—9.5 mm. Front wing 4.8—6.4 mm. Antennae with a white band. Index of postanellus about 5.2—5.5. Lower half of frons

rather concave. OOL : diameter lateral ocellus, 9 : 6; 8 : 6; 8 : 5. OOL region alutaceous; upper frons rugose. Thorax black; ivory-yellow marking occurs on the following parts: anterior margin of notum 1; two spots on dorsal end of epomia, about opposite to the prescutal sutures (these spots are rather typical); tegulae, subalar prominence, scutellum 2. Epomia relatively strong. Areola with sides definitely converging. Both propodeal carinae complete; the posterior somewhat raised sublaterally. Legs with all coxae and trochanters in most specimens ferruginous, other parts yellowish to ferruginous. Front tibia conspicuously inflated, index, 4.1—4.6, Fig. 37. Gaster with petiole mostly fuscous, other parts orange, tergite 2 and following tergites with regular, alutaceous microsculpture. Ovipositor very short, 0.24—0.28 length of front wing.

Male. — Body length 8.7—10.5 mm. Front wing 5.7—7.0 mm.

Head black. Palpi light brown. Mandibles partly light brown. Anterior margin of clypeus polished. Convexity of clypeus and face moderate. Both clypeus and face with fine and dense punctures, polished between, and conspicuous grey pilosity. Antennae rather long (about length of front wing) and slender, with tyloidea on segments (16) 17—22. Frons somewhat concave, for the greater part rugose. Antennal scrobes hardly defined, more polished, with wrinkles. Inner orbit, from upper articulation of mandible to vertex, marked with yellow. Frontal orbit, OOL-region and vertex subpolished to somewhat alutaceous. OOL : diameter lateral ocellus, 1.3—1.6. Temple and gena polished, with rather widely placed (at about 2 to 3 × their diameter) fine punctures, implantations of grey, conspicuous hairs. Gena rather broad. Breadth gena (at base of eye): breadth compound eye, 3 : 4. Outer orbits marked with yellow.

Thorax black. Anterior margin and two spots on hind margin of notum 1, tegulae and subalar prominence, marked with ivory. Scutellum 2 and notum 3 sometimes with yellow markings. Notum 1 polished between regular, dense, punctures and some wrinkles. Epomia present. Mesoscutum and scutellum 2 polished with rather widely placed fine punctures. Episternum 2 with dense touching rough punctures. Propodeum rugose dorsally, with both transverse carinae present. Posterior carina sublaterally crested. Pleural parts of propodeum with regular dense puncturing. Legs with all coxae and trochanters dark brown to black. Femora, tibiae and tarsi of front and middle legs orange-yellow. Hind femur dark ferruginous, tibia and basitarsus brown, base of tarsal segments 2, 3 and 4 marked white. Segment 5 brown. Index of front femur, 4.2—5.0; of hind femur, 4.7—5.2.

Gaster with segments 2, 3 and 4 orange; segment 1 black, apex fuscous.

The type series of *Cryptus investigator* comprises seven specimens: one male and six females (Tschek, 1870a: 123). Five females and one male were sent to me by Dr. Max Fischer. As the lectotype I have chosen a specimen which is probably a syntype; it bears a printed label with 1872 as the date, but most of Tschek's specimens have this label which was probably put on most of his material after his death.

Characteristics of the lectotype of *Cryptus investigator* Tschek. Female, 8.5 mm. Front wing 6.4 mm. Labels: a white tag with "Type" in red ink (Tschek's writing); *Cryptus tuberculatus* Grav. ♀ (= *investigator* Tschek) (written), Habermehl det. (printed). Lectotype hereby designated and labelled accordingly. Head black to somewhat rufous in the clypeal and facial regions. Antennae rufous to brown, segments 7—10 white dorsally. Index of postantellus 5.2. Legs with all coxae and trochanters ferruginous. Front tibia strongly inflated, index 4.3. Ovipositor, 0.25 length of front wing. Three other syntypes were labelled paralectotype.

Material examined: No data: ♀, lectotype of *C. tuberculatus* Gravenhorst. Austria: ♀, Piesting, leg. Tschek, lectotype of *C. investigator* (NMW); 2 ♀, Piesting, 1872, leg. Tschek (printed), paralectotypes of *C. investigator* (NMW); ♀, Piesting, Tschek (printed) paralectotype of *C. investigator* (NMW); ♀, Piesting, 1871, leg. Tschek (written) (NMW); ♂, Piesting, 1872, Tschek (printed), written "Type" (NMW). France: ♀, Forêt de Campet (L. et G.) 120 m, 17—22.VIII.1966, leg. R. T. Simon Thomas (PD). Germany: 5 ♂, Worms, leg. Habermehl; VII.1905; 4.VI.1894 (2); 4.VIII.1918 (2) (SM). Poland: 2 ♀, Carlowitz, 11.VIII.1901, coll. Dittrich (ZI); ♀, Weidenhof, 10.VI.1902, leg. Dittrich (ZI). No locality: ♀, det. Schmiedeknecht as *C. graciosus* Tschek (NMW); ♀, locality illegible, 24.VIII.1902, leg. Dittrich (ZI).

### *Cryptus spiralis* (Geoffroy in Fourcroy, 1785)

*Ichneumon spiralis* Geoffroy (in Fourcroy), 1785, Entomologia Parisiensis 2: 407 (no 42) (type lost).

*Cryptus inconspicuus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 447, ♂.

*Cryptus hispanicus* Habermehl, 1918, Zeitschr. f. Wiss. Ins.-Biol. 14: 147, ♀ ♂.

*C. spiralis* has been known since Linnean times. It is a widely distributed species in the Palearctic region (Townes, 1965; Meyer, 1934). The description given by Geoffroy does not contradict some very general features of this species. There is thus no reason for rejecting the name, though the type material is lost. In this case also the interpretation of authors goes back to Gravenhorst (1829: 454).

With some experience the *C. spiralis* female can be rather easily recognized; in particular, the ovipositor tip is characteristic (Pl. 1 Fig. 6). Difficulties could arise with a completely ferruginous or even orange form, which I suspect might turn up in the Palearctic area, more especially because some specimens show a deep ferruginous to even purple undertone in the gaster, which points in the direction of the mentioned variations. Such forms could easily be mistaken for *C. diana*. The relatively stout femur and the ovipositor tip might help to identify such specimens.

Undoubtedly more difficult to identify is the *C. spiralis* male, which resembles the *C. armator* male in some respects. Two important differential characters are: tyloidea on antennal segments 15—23 (14—22) and the stout front femur, disregarding the colour of the gaster. The latter is fuscous in most specimens, but I found a male from the south of France and one from Poland with the third gastral tergite marked with rufous to orange. Also males with the gaster entirely rufous or orange could cause confusion.

Female. — Body size 9.7—11.0 mm. Front wing 6.6—7.6 mm.

Head black. Antennae rufous to dark brown. Index of postanellus 5.1—6.0. Antennal segments 7—10 white dorsally. Labial and maxillary palpi and labrum, light to dark brown. Dorsal rim of mandibulae and malar space towards mandibular base somewhat lighter. Clypeus and facial convexity strongly convex. Face coriaceous with silvery, adpressed pilosity. Antennal scrobes with strong, transverse ridges, lower half of frons strongly concave. Sculpture of upper half of frons, varying between finely and roughly rugose. Inner orbits, especially the OOL-region, alutaceous to almost polished lateral of posterior ocelli. Gena broad. Genal carina meeting the hypostomal carina distinctly behind the base of the mandible (width mandible: distance between mandible and meeting place, 1 : 1). Temple and gena polished to somewhat alutaceous with rather widely spaced to dense, fine, setiferous punctures.



Thorax black. Epomia well-developed. Mesoscutum polished, with scattered punctures, separated by about  $2-3 \times$  their diameter. Pleural regions and propodeum roughly sculptured. Both propodeal carinae present; the posterior well developed and sublaterally dentated. Wings subhyaline to slightly infusate. Areola small with strongly converging sides, anterior side thus short. Legs with all coxae ferruginous. Rest of legs orange to more brownish in the hind tibia and basitarsus. Front tibia slender, index 6.0—6.8, front femur relatively thick, index 4.1—4.5. These two characters of the front leg are the most conspicuous differences between this species and *C. viduatorius*.

Gaster deeply ferruginous to blackish. Hind margin of postpetiole polished, rest of tergites regularly and closely coriaceous. Ovipositor conspicuous, 4.0—4.5 mm, the tip shown in Pl. 1 Fig. 6.

Male. — Body length 9.0—10.4 mm. Front wing 6.0—6.7 mm.

Head black; specimens do occur having the entire face and clypeus ivory-white, including most of the mandibles, labrum, palpi and malar space. Also, the face may show two black lines between antennal socket and upper mandibular condyle. Scapi and outer orbits marked with ivory. Mandibles, clypeus, face, temple and gena in fresh specimens with erect to suberect, long silvery pilosity. Frons not very concave. Antennal scrobes with rough transverse wrinkles. Upper medial part of frons, including the region of anterior ocellus rather conspicuously wrinkled. OOL-region somewhat alutaceous to almost polished. OOL : diameter posterior ocellus, 8 : 7 (9 : 7). Tyloidea on antennal segments 15—23 (14—22) (this might be a useful character in dubious cases). Temple and gena polished, with rather close, fine punctures, implantations of hairs. Genal and hypostomal carinae somewhat raised. Lower gena rather broad, width about that of compound eye.

Thorax black, strongly marked with ivory: pleuron 1, anterior and posterior margin of notum 1, tegulae, scutellum 2, subalar prominence (markings subject to variation!). Epomia in most specimens strong. Pleural parts and propodeum rather roughly sculptured. Propodeal transverse carinae often rather obliterated. Wings hyaline with anterior side of areola narrow, sides rather converging. In the hind wing the position of the nervellus (Cu1 + Cua) is rather strikingly opposite in a number of specimens, and postfurcal. Coxae and trochanters of front and middle legs richly marked with ivory; other parts of front and middle legs mostly orange. Coxae and trochanters of hind leg black, femur orange, tibia fuscous and basitarsus fuscous, tarsal segments 2, 3 and 4 white. Front femur rather stout in appearance, index 4.0—4.4.

Gaster fuscous to black in most specimens. The tergites 2 and 3 tend towards a more ferruginous or rufous colour. Tip of clasper truncate.

Taschenberg (1865) synonymized *Cryptus inconspicuus* Gravenhorst with *Cryptus spiralis*. This must have been done rather accidentally, since the holotype is very difficult to identify. I nevertheless agree with Taschenberg on the strength of the following characters: antennae with tyloidea on segments 15—24. Index front femur, 4.3.

Characteristics of the holotype of *Cryptus inconspicuus* Gravenhorst. Male, 6.7 mm. Front wing 4.3 mm. Labels: none. Holotype labelled accordingly and identified as *Cryptus spiralis* (Geoffroy).

In 1918 Habermehl based a *Cryptus* species on 1 ♀ and 1 ♂ from Spain (Astorga Pagan. Hispania). Some years later (Habermehl, 1926) he withdrew this species, stating: "*Cryptus hispanicus* Habermehl ♀ ♂ = *Cryptus spiralis* Fourcr. Terebra nur etwa so lang als das Abdomen, nicht wie angegeben, von Körperlänge". The type series of

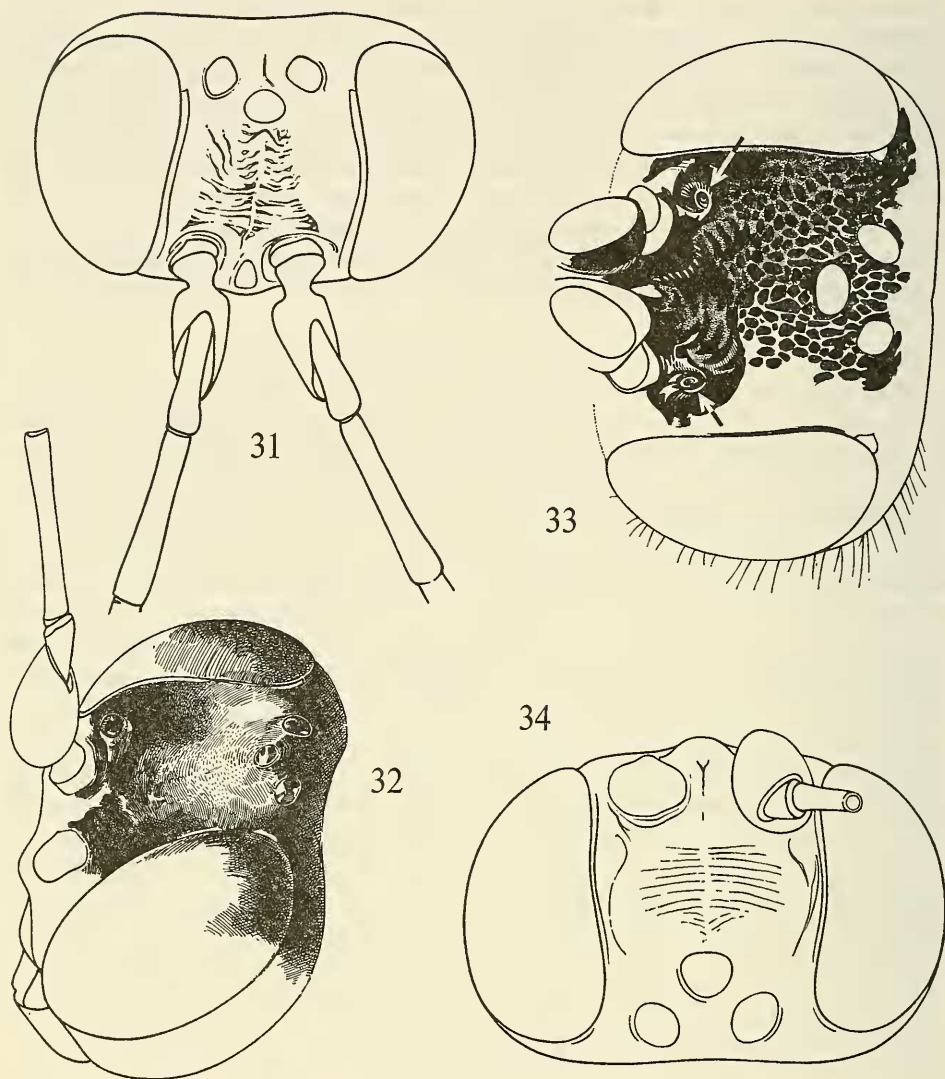


Fig. 31—34. Heads of *Cryptus* and *Meringopus*: 31, *C. inculcator* (L.), ♀, Israel, Matta, 16.V.1967, leg. Jeekel (MA), dorsal aspect; 32, *C. armator* F., ♀, Piesting, coll. Tschek (NMW), latero-dorsal view; 33, *Meringopus cyanator* (Grav.), ♀, Leiden (Netherl.) (ELW), dorsal tentorial pits; 34, *C. armator* F., ♀, Piesting, coll. Tschek, dorsal aspect

*C. hispanicus* is still present in Habermehl's collection at Frankfurt (Main), but the author must have removed the labels.

Characteristics of the lectotype of *Cryptus hispanicus* Habermehl. Female. Labels: Astorga Paganetti Hispania. Lectotype hereby designated and labelled accordingly. A vague yellow spot on scutellum 2 (compare original description), right front and middle leg missing, a somewhat purple coloured gaster. Undoubtedly the type material.

Material examined. — No locality: ♂, Tauria (?), the holotype of *Cryptus inconspi-*

*cnus* Gravenhorst (ZI); ♀, (ex coll. Schmiedeknecht) (ELW). France: ♂, Vaucluse, Carpentras, 1—4.VIII.1953, leg. P. M. F. Verhoeff (PD). Germany: ♀, Heidelberg, VII.1915 (RMNH). Netherlands: ♀, Leersum, 30.VII.1919, leg. Koornneef (ELW); 3 ♂, Venlo, 2.VI.1936, coll. Lindemans (MR); 5 ♂, Venlo, 30.V.1936, coll. Lindemans (MR). Poland: 4 ♂, Podkowa Lesna ad Warszawa, 10.VIII.1955, 18.VI.1956, 19.VI.1956, 1.VI.1957, coll. J. Glowacki; 3 ♀, Podkowa Lesna ad Warszawa, 13.VII.1952, 15.VII.1955, 3.VII.1956, coll. J. Glowacki. Spain: ♀, Astorga, leg. Paganetti (?), coll. Habermehl (the lectotype of *C. hispanicus*) (SM; No SMF: H 1628).

#### *Cryptus diana*e Gravenhorst, 1829

*C. diana*e Gravenhorst shows strong variability in the Holarctic region. Difficulties arise regarding the taxonomic rank to be given to its forms<sup>1)</sup>. In the Nearctic, what is probably the American segregate has been split up into four subspecies by Townes (1962) and these seem to have reasonably distinct geographical ranges. In the Western Palearctic it is more difficult to show the proper geographical distribution of (at least) three different subspecies: *C. diana*e *diana*e, the nominate subspecies, *C. diana*e *speciosus* and *C. diana*e *obscuripes*. The latter is restricted to the boreal zone and some mountainous regions, while *C. diana*e *diana*e is widely spread in the Western Palearctic region. *C. diana*e *speciosus* is a southern Palearctic subspecies.

Specimens of the Palearctic *C. diana*e *obscuripes* identified with the key by Townes (1962: 244) would run down to *C. albitarsis albitarsis*. As I have not seen enough Nearctic material I am not placing *albitarsis* in the synonymy of *C. diana*e *obscuripes*, but merely suggest the co-identity. The whole complex of *C. diana*e would make a good subject for deeper study.

Finally Habermehl (1918) described as *C. solitarius* a specimen which undoubtedly belongs to the *diana*e complex, but it occupies an interesting position between *C. diana*e *diana*e and *C. diana*e *obscuripes*, rather weakening the taxonomic rank of both segregates. For the present I prefer to name it *C. diana*e f. *solitarius*. The females in the *C. diana*e complex can be distinguished as follows (*C. diana*e *speciosus* is not included):

#### KEY TO THE FEMALES IN THE *Cryptus diana*e COMPLEX

1. Front wing 5.5—7.7 mm, larger specimens. Hind femur red to orange-red. All coxae black. Postpetiole and tergites 2, 3 and 4 mostly orange to dirty red. Apex of gaster fuscous. Postanellus very slender, index 7.0—8.0. Ovipositor 0.52—0.60 length of front wing . . . . . *C. diana*e subsp. *diana*e
- Front wing 5.5—7.3 mm, generally smaller. Hind femur between ferruginous and fuscous. Coxae between ferruginous and brown. Gaster either with tergites 2 and following orange, or with tergites 2, 3 and 4 orange-red and apex fuscous. Index of postanellus, 5.8—6.9. Ovipositor 0.48—0.53 length of front wing . . . 2
2. Gaster beyond postpetiole orange. Hind femur between ferruginous and fuscous. Ovipositor 0.48—0.53 length of front wing. Index of postanellus, 5.7—6.9 . . . . . *C. diana*e subsp. *obscuripes*
- Gaster with tergites 2, 3 and 4 orange-red and apex fuscous. All femora brownish-ferruginous. Ovipositor 0.51 length of front wing. Index of postanellus, 5.7. OOL : diameter lateral ocellus, 8 : 4.5. Antenna with a white band . . . . . *C. diana*e f. *solitarius*

<sup>1)</sup> . . . "but the amount of difference considered necessary to give to any two forms the rank of species cannot be defined" (Darwin, Origin of Species, Chapter 2).



*Cryptus diana* *diana* Gravenhorst

*Cryptus diana* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 545, ♀ (no 88).

*Cryptus stenogaster* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 529, ♂ (no 77).

*Cryptus leucostomus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 531, ♂ (no 78).

*Cryptus gracilicornis* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 553, ♀ (no 92).

*Cryptus solitarius* Habermehl, 1918, Zeitschrift f. wiss. Ins.-Biol. 14: 149, ♀.

Characteristics of the lectotype of *Cryptus diana*. Female, 10.2 mm. Labels: a white tag "f" (a syntype). Lectotype hereby designated and labelled accordingly.

Head black to rufous. Inner and outer orbits with yellow lining. Palpi brown. Clypeus shiny, with scattered punctures, reddish. Face and clypeus with short, grey hairs. Antennal scrobes deeply concave with transverse wrinkling, frons roughly sculptured. Gena almost polished, with scattered punctures. Antennae rufous, with segments 6, 7 and 8 white dorsally. Index of postanellus, 7.1.

Thorax black. Anterior margin of pronotum rufous to brown. Scutellum 2 with a rufous spot. Tegulae and base of wing rufous to brownish. Epomia present. Notum 1 roughly sculptured. Mesoscutum with punctures separated by about their diameter, interspaces polished. Prescutal sutures strong. Propodeum roughly sculptured, both transverse carinae developed. Legs with all coxae and trochanters rufous. All femora and tibiae orange, tarsi brownish.

Gaster with petiole dark red. Postpetiole and tergites 2, 3 and 4 orange. Apex fuscous. Tergites with fine, alutaceous microsculpture.

Description of the female of *C. diana diana*. Front wing 5.5—9.3 mm. Postanellus very slender, index, 7.0—8.0. In larger specimens the frons is mostly strongly concave, in smaller specimens this concavity is less conspicuous (Fig. 45). Antennal scrobes often with conspicuous transverse wrinkling. OOL wider than diameter of lateral ocellus. Epomia strong. Areola in most specimens with strongly converging sides (Pl. 1 Fig. 2). Both transverse carinae of propodeum well-developed, in many specimens with a pattern as in Fig. 30. (I found one female: Ermelo, 2.VIII.1936, coll. Lindemans (MR), with abnormally strong sublateral horns of the posterior propodeal carina, almost of the size of *C. spinosus*. This is a very exceptional case). Index of front femur variable, 4.0—5.0.

Gaster finely and very regularly alutaceous. Ovipositor in larger specimens 0.55—0.60 length of front wing; in smaller specimens 0.48—0.53 length of front wing.

The colour pattern of *C. diana diana* is rather constant: all coxae ferruginous to black. All femora and tibiae orange, apex of hind tibiae slightly fuscous. Tarsi brown. Gaster with petiole mostly fuscous to dark red, postpetiole and tergites 2, 3 and 4 brightly orange.

Description of the male of *Cryptus diana diana*. The male of the nominate subspecies has some rather constant colour characters. I agree with Kerrich (1962) regarding their value: "they must be used with discretion". In the main the orange-red colour pattern is in accordance with the female. The ivory-yellow colour marking in the male is as following: palpi, base of mandibles, clypeus, central spot in the face, inner orbits and malar space broad, outer orbits, anterior margin of pronotum, posterior margin of pronotum, (specimen from the Alps), scutellum 2, tegulae, subalar prominence, front coxae and trochanter, tarsal segments 2, 3 and 4 of hind leg.

Lower frons (antennal scrobes) much less concave than in the female. Upper half of frons rather conspicuously wrinkled (rugose) (Fig. 44). Temple and gena polished and

with widely spaced fine punctures from which silvery hairs arise. Face, clypeus and mandibles with silvery hairs.

Areola with rather converging sides (Pl. 1 Fig. 8). In most specimens both propodeal carinae indicated. Coxae and trochanters of middle leg *without* yellow marking (this could be a constant character). Index front femur, 4.4—5.2. Index hind femur, 5.5—6.2. Gaster with at least postpetiole and tergites 2, 3 and 4 orange; tergites 5, 6 and 7 fuscous to black.

Characteristics of the holotype of *Cryptus stenogaster* Gravenhorst. Male, 12.0 mm. Labels: none; holotype labelled accordingly.

Characteristics of the lectotype of *Cryptus leucostomus* Gravenhorst. Male, 10.5 mm. Labels: none; lectotype labelled accordingly.

Characteristics of the holotype of *Cryptus gracilicornis* Gravenhorst. Female, 11.5 mm. Labels: none; holotype labelled accordingly. Index of postanellus, 7.0. Antennae without white band. Ovipositor about 0.5 length of front wing.

Characteristics of the holotype of *Cryptus solitarius* Habermehl. Female, 9.6 mm. Front wing 7.2 mm. Labels: a blue tag 394, a white tag Hrh (Harreshausen) 15.IX.92 Hbm., a red Museum label "Typus", a white tag with Habermehl's writing "Cryptus solitarius Hab. ♀ n. sp." Holotype labelled accordingly (No SMF; H 1305). Det. *C. d. dianae* f. *solitarius*.

Head black. Palpi brown. Labrum light brown. Clypeal and facial convexity well-shown, with scattered punctures. Lateral parts of face densely punctured. Face with silvery-grey pilosity. Inner orbits marked with ivory, the spot connecting compound eye and antennal socket. Antennal scrobes polished, rather narrow, 0.3 of frons. Frontal concavity not strong, only developed in the region of the antennal sockets. The upper part (about 0.7) of the frons is only slightly concave. This region is regularly wrinkled. OOL region alutaceous. Head wide between the compound eyes. OOL : diameter lateral ocellus, 8 : 4.5. Antennae slender. Segments 6 (apex), 7, 8 and base of 9 marked with white. Postanellus long, index 5.7. Temple and gena polished, regularly and widely punctured, with rather short grey bristles. Outer orbits marked with yellow and spot on eye margin.

Thorax black. Epomia strong. Epicnemial carina running up 0.5 of distance between sternaulus and subalar prominence. Entire thorax roughly sculptured, except mesoscutum which is polished, with heavy punctures. Scutellum 2 polished, with wide puncturing. Propodeum with both carinae well-developed. The posterior carina sublaterally crested and dentated. Propodeal spiracle round oval, index 2.0. Wings with front wing infusate, hind wing hyalin. Areola with strongly converging sides. Nervulus antefurcal. Legs with all coxae, trochanters and femora brownish ferruginous. Tibiae and tarsi of all legs more or less yellowish brown.

Gaster with tergites 2, 3 and 4 orange; segment 1 and apex ferruginous. Tergites 2, 3 and 4 very finely alutaceous. Ovipositor 0.51 length of front wing.

Biology. — This species is reported as a parasite of a pyraustid (Lepidoptera) (Townes, 1965), a caradrinid (Lep.) and a hydriomenid (Lep.) (Schmiedeknecht, 1931), and I found it associated with a calamity of *Ectropis bistortata* (Goeze) at Grollo (Netherlands) on *Larix*, but I could not prove whether it was parasitizing the larvae.

Material examined. — Austria: ♀, the holotype of *C. gracilicornis* Grav. no locality (ZI). Germany: ♀, Worms, 17.VI.1907, coll. Habermehl (SM); ♂, Worms, 4.VIII.1918, coll. Habermehl (SM); ♀, Worms, 3.IX.1919, coll. Habermehl (SM); ♀, Harreshausen, 15.IX.1892, leg. Habermehl (holotype of *C. solitarius*) (SM); ♀, Hrh

(Harreshausen), IV.1896, coll. Habermehl (SM); Babenheim, 2 ♀, X.1900, 3 ♀, IX.1901, coll. Habermehl (SM); Bürgst (W), ♀, 7.VI.1896, ♀, 12.VI.1903, coll. Habermehl (SM); ♂, Braunschweig, coll. Habermehl (SM); ♂, W./RSG (?), 25.IX.1919, coll. Habermehl (SM); ♀, loc. illegible, 22.VI.1907, coll. Dittrich (ZI). Italy: ♂, Funes (Villnössz), prov. Bolzano, S. Pietro, 1200—1400 m, 20.VII—9.VIII.1968, leg. van Rossem (PD). Netherlands: ♂, Grollo (Dr.), 18.V.1960, leg. van Rossem (PD); ♂, Ermelo, 11.V.1936, ♀, 28.VII.1936, 4 ♀, 2.VIII.1936, 2 ♀, 7.VIII.1936, 6 ♀, 13.VIII.1936, all coll. Lindemans (MR); ♀, Garderen (Houtdorp), 21.VIII.1967, leg. van de Bund (PD); ♀, Bennekom Hullenberg, 17.IX.1967 on *Calluna*, leg. van de Bund (PD); ♀, Rhenen, 2.VI.1912, ♀, 6.VIII.1936; 3 ♀, 8.VIII.1936, 2 ♀, 9.VIII.1936, ♀, 17.VII.1936, ♀, 22.VIII.1936, all coll. Koornneef (ELW); ♀, Leersum, 14.VIII.1920, leg. Koornneef (ELW); ♂, Soesterberg, 12.VIII.1928, leg. Bouwman, coll. Koornneef (ELW); ♂, den Dolder, 8.IX.1927, leg. Bouwman, coll. Koornneef (ELW); ♀, Zevenhuizen (ZH), 31.VIII.1931, coll. Lindemans (MR); ♀, Burgst (NB), IX.1917, coll. Smits van Burgst (ELW); ♂, Tonsel, 17.V.1934, coll. Lindemans (MR); ♀, Epen (L), 18.VIII.1923; ♀, Epen, VIII.1926, both coll. Lindemans (MR). Spain: 2 ♀, Elihe, leg. Schmiedeknecht, coll. Habermehl (SM). No locality: ♂, lectotype *C. leucostomus* Grav. (ZI); ♂, holotype *C. stenogaster* Grav. (ZI); ♀, lectotype *C. dianae* Grav. (ZI); ♂, (DEI); ♀, coll. Koornneef with label of Schmiedeknecht "*Cryptus minator* Grav." (ELW).

### *Cryptus dianae obscuripes* Zetterstedt

*Cryptus obscuripes* Zetterstedt, 1840, *Insecta Lapponica*: 370, ♂ (no. 8).

?*Ischnus albitarsis* Cresson, 1864, *Proc. Ent. Soc. Philadelphia* 3: 194, ♂.

*Cryptus borealis* Thomson, 1873, *Opusc. ent.* 5: 484, ♀ (no 13) (non Zetterstedt).

*Cryptus carpathicus* Szépligeti, 1916, *Ann. Mus. Nat. Hung.* 14: 246, ♀.

The type material of Zetterstedt was investigated by Horstmann (1968). He identified the male holotype of *Cryptus obscuripes* Zetterstedt and gave *C. obscuripes* as the right name and bore out Holmgren's synonymy of *Cryptus borealis* Thomson, 1873, with *C. obscuripes*. I agree with Horstmann on both points, but I think *C. obscuripes* represents a boreal subspecies of *C. dianae*, which also occurs in scattered mountainous localities in Central Europe. As far as I could judge from the scanty material available, it will eventually be possible to find specimens which more or less connect the two forms, but for the present it seems that they represent allopatric populations.

Female. — Body length 7.3—10.5 mm. Front wing 5.4—7.4 mm. Index of postanellus, 5.8—7.0. Front femur index, 4.7—5.2. Propodeal carinae, Fig. 20. Hind femur fuscous-ferruginous to fuscous. Gaster except for petiole, bright orange in typical specimens. Ovipositor 0.48—0.53 length of front wing.

Male. — Body length, 10.5 mm. Front wing, 7.2 mm. I have seen only one male, the holotype of *C. obscuripes*. This specimen closely agrees with the *C. dianae* male. There is some difference in the colour pattern: middle and hind femora fuscous-ferruginous; gaster with all tergites bright orange, apex somewhat fuscous. The anterior side of the areola somewhat wider than in *C. dianae dianae* males, a tendency which I also observed in the females.

The original material of *Cryptus borealis* Thomson, 1873, comprises 9 specimens, kept in the Department of Entomology of the Zoological Institute at Lund. Through the kind-



ness of Mr. Fil. lic. Hugo Andersson I have been able to study three of these specimens.

In a later paper Thomson (1896) suggested the co-identity of his species with Zetterstedt's.

Characteristics of the lectotype of *Cryptus borealis*. Female, 7.3 mm. Front wing 5.4 mm. Labels: a white tag (printed) "Norl" (= Norrland, the type locality). A green tag "1968/7". Lectotype hereby designated and labelled accordingly. The specimen is in bad condition.

Head and thorax ferruginous (this colour is not uncommon in Scandinavian material). Antennae, both hind legs beyond coxae and left front wing missing. Inner and outer orbits with yellow lining. Antennal scrobes concave and with transverse wrinkling. Upper frons not concave, vaguely rugose. OOL : diameter posterior ocellus, 7 : 5. Temple and gena polished, punctures widely scattered and very vague. Coxae light brown to ferruginous. Other parts of legs brown. Both propodeal carinae present, area superomedia indicated (Fig. 20).

Gaster, except for fuscous base of petiole, orange. Tergites from tergite 2 onwards finely alutaceous. Ovipositor 2.7 mm.

As Szépligeti mentions no other specimens, the following description refers to the holotype of *Cryptus carpathicus* Szépligeti, 1916.

The specimen is agreeing with the lectotype of *Cryptus borealis* Thomson, 1873 (= *Cryptus obscuripes* Zetterstedt).

Characteristics of the holotype of *Cryptus carpathicus*. Female, 7.7 mm. Front wing 5.4 mm. Labels: a printed label "A.T. Füred (= Also-Tátrafüred) Szépligeti; a red label; a label with Szépligeti's writing: "*Cryptus* (42) *carpathicus* (as spelled on label) n.sp. ♀". Holotype labelled accordingly. Head and gaster badly damaged by dermestids; both antennae present, with white marking. Index of postanellus, 6.7. Ovipositor 2.8 mm.

Biology. — Jussila (1965) gives some information about the occurrence of this species in the subarctic region of Finland.

Material examined. — Germany: ♀, label illegible, VII.1900, leg. Habermehl (SM) (this is, in all probability, the specimen on which Habermehl (1918) reported. Hungary: ♀, Also-Tátrafüred, holotype of *C. carpathicus* Szépligeti (TM). Sweden: ♂, Talvig, holotype of *C. obscuripes* Zett. (ML); ♀, Norrland, coll. Thomson, lectotype of *C. borealis* Thoms. (no. 7/1968); ♀, Lapland, coll. Thomson no. 9/1968) (ML); ♀, Åre (Jamtland), coll. Thomson (no. 8/1968 ML).

### *Cryptus dianae speciosus* Tosquinet

*Cryptus speciosus* Tosquinet, 1896, Mém. Soc. ent. Belg. 5: 190—192, ♀.

The type material of *C. speciosus* is in the Institut Royal des Sciences Naturelles de Belgique at Brussels. Two females were kindly sent to me by Mr. Paul Dessart. I regret to have found Tosquinet's material too late to insert it properly in my manuscript. Both females represent an interesting red form of *C. dianae*, probably the southern segregate of the species. With my key to the females of the genus *Cryptus* they are easily recognized as *C. dianae*.

Characteristics of the lectotype of *C. speciosus* Tosquinet. Female, 11.0 mm. Front wing. 7.3 mm. Labels: a small tag (red ink) "type"; a round blue tag "du Buysson Algérie 1894"; a white label "collection Dr. J. Tosquinet" (printed); a label "*Cryptus*

*speciosus* Tosq. (written) det. J. Tosquinet (printed). Lectotype labelled accordingly and hereby designated.

Head with frontal and lateral parts orange. Index of postanellus, 7.0. OOL : diameter lateral ocellus, 9 : 6. Thorax with part of notum 1, mesoscutum, scutellum, central area of notum 3 and some vague spots laterally and ventrally, orange. Lateral parts of mesothorax and propodeum entirely, black. All coxae and other parts of legs bright orange.

Gaster orange. Ovipositor 0.47 of front wing, tip agreeing with *C. diana diana*.

A second specimen, closely agreeing with the lectotype, was labelled "paralectotype". It has the postanellus still more slender.

### *Cryptus gogorzae* Kriechbaumer, 1898

*Cryptus gogorzae* Kriechbaumer, 1898, An. Soc. Esp. Hist. Nat. 27 (2): 168, ♂ (holotype not seen).

*Cryptus ebriolus* Seyrig, 1927, Eos 3: 207, ♀ ♂ (sec. G. Ceballos, 1931) (types not seen).

Ceballos (1931: 48—49) synonymized *C. gogorzae* and *C. ebriolus*. I regret that I have not seen types of these species, nor material of the female. In material from Spain belonging to the Leiden Museum I found one male which did not agree with any known species in western Europe. When running down this specimen with the key by Ceballos (1931), I found *C. gogorzae* to be the only possibility. A description of this male follows.

Description of the male. — Body length 10.8 mm. Front wing 7.2 mm. Head black, except for ivory marking on dorsal rim of mandibles and inner orbits from malar space up to vertex. Clypeus large, with broad polished anterior margin, very slightly protruding medially. Upper part of clypeus with some rough punctures. Face closely punctured with short grey pilosity. Lower half of frons concave; antennal scrobes polished. Upper half of frons with transverse wrinkles, ocellar region wrinkled. OOL almost polished. OOL : diameter lateral ocellus, 8 : 7. Temple and gena with short, erect hairs and shallow ventro-dorsal wrinkling with punctures between. Antenna with scapus globuliform; flagellum long. Tyloidea on segments 19—24.

Thorax black, roughly sculptured all over. Epomia present. Mesoscutum polished between coarse, shallow, punctures. Scutellum 2 polished, with some coarse punctures. Both propodeal transverse carinae complete, slightly raised. Sublateral corners of posterior carina somewhat dentate. Propodeal spiracle long elliptic. Legs with all coxae and trochanters, middle and hind femora black. Front femur dorsally with a brown streak. Index of hind femur, 5.8. Front and middle tibiae dirty brown, dorsally with a conspicuous ivory streak. Hind tibia and most of basitarsus black. Segments 2, 3 and 4 of hind tarsus conspicuously white; a spot on apex of basitarsus. Other tarsi fuscous. Wings subhyaline; areola with sides definitely converging.

Gaster with first segment black, long, not quite reaching the length of first four segments of flagellum. Tergites 2—6 brownish-ferruginous, tending to dirty red; apex black.

Female. — Unknown to me.

Material examined. — Spain: ♂, prov. Alicante, Denia, Las Rotas, 3—4.V.1959, leg. J. van der Vecht (RMNH).

### *Cryptus armator* Fabricius, 1804

*Cryptus armator* Fabricius, 1804, Systema Piezatorium: 86, ♀ (no 69).

*Cryptus albatorius* auctorum, non Müller, 1776.

*Cryptus rusticator* Zetterstedt, 1840, *Insecta Lapponica*: 368, ♂, Lipsiae (sec. Horstmann, 1968).  
*Cryptus incisus* Tschek, 1870a, *Verh. zool.-bot. Ges. Wien* 20: 121—122, ♂.

The name *Ichneumon albatorius* was first used by Müller (1776: 152), who indicated that he had not seen the species himself and referred to Stroem's *Ichneumon leucomelas* in "Troldhiemske og Norske videnskabers Selskaps skrifter" 4: 66 (1768). For this reason the name *I. albatorius* had to be replaced by the binomen *Ichneumon leucomelas*, which was consequently done by De Dalla Torre (1901—1902). However, Stroem's species, *Ichneumon leucomelas*, is undoubtedly not *Cryptus albatorius* of authors, which at once becomes clear when the author states that the gaster of his specimen has white spots, thus excluding all true *Cryptus* species in the modern sense. The result of all this is that neither the name *leucomelas* nor *albatorius* can be used for the species under consideration.

When studying Fabricius' collection at Copenhagen I found a type specimen which had hitherto escaped attention: *Cryptus armator*, by chance identical with *Cryptus albatorius* of authors. So it seems that we can use this Fabrician name.

Characteristics of the lectotype of *Cryptus armator*. Female, 9.8 mm. Front wing 7.0 mm. A badly damaged specimen. The following parts missing: left compound eye, left antenna, left front leg, both middle legs, left hind leg, left part of gaster. Labels: "*armator*" in Fabricius' writing. Lectotype hereby designated and labelled accordingly.

Head with OOL : POL, 9 : 13; OOL : diameter posterior ocellus, 9 : 7. Some transverse ridges in lower half of frons. Index postanellus, 5.4. Index front femur, 4.4. Index hind femur, 4.6. Front tibia very slightly inflated. Axillary vein in hind wing weakly pigmented and almost parallel to hind margin of wing. Ovipositor, 4.0 mm.

Description of the female. — Length of body, 9.5—15.4 mm. Front wing 7.5—11.0 mm. Head ferruginous to black. Labrum and inner and outer orbits mostly ivory. Face with adpressed grey hairs. Facial convexity present. Scapus relatively large, ovate in shape. Index of postanellus, 5.3—6.2. Antennae rufous to brownish. Entire frons up to median ocellus deeply concave. Fig. 32 and 34. Lower half of frons polished, often with transverse wrinkles. Upper half of frons alutaceous to slightly rugose. OOL slightly larger than diameter lateral ocellus. There is some indication of a dorsal tentorial pit in the shape of a dorsolateral knob directly behind the antennal socket. Temple and gena polished, regularly, but rather widely punctured, implantations of short to medium-long, suberect to erect hairs. Occipital, genal and hypostomal carinae somewhat raised.

Thorax ferruginous to black. The following parts may show ivory-yellow markings: anterior and posterior margin of notum 1, subalar prominence. Epomia present, but often weak. Thorax in medium-sized specimens rather finely sculptured all over with suberect to erect, grey pilosity. Propodeum rugose, with both transverse carinae well-developed, posterior carina running up rather steeply, horseshoe-shaped, slightly dentated sublaterally. Horizontal part of propodeum: sloping part, 1 : 2 (approx.). Propodeal spiracle elliptic. Wings subhyaline. Areola relatively small, with strongly converging sides (Fig. 7). Axillary vein in the hind wing converging towards hind margin of wing, weakly pigmented. Coxae and trochanters ferruginous to black, all femora front and middle tibiae orange, hind tibia brownish. Indices of femora, 4.4—4.6 (1), 4.7—4.8 (2), 4.6—5.0 (3). The thorax is shown in Fig. 1.

Gaster mostly with petiole and part of postpetiole fuscous, following segments bright orange. According to Perkins (1942), British material also has part of the second tergite infusate at the base. All tergites with very regular alutaceous microsculpture. Ovipositor about half the length of front wing. Tip of ovipositor Fig. 47.



Description of the male. — Body length 8.0—13.2 mm (very small males occur). Front wing 5.6—9.3 mm. Head black with very conspicuous yellow markings on the following parts: palpi, labrum, mandibles, clypeus, entire face (compare *C. armator* f. *incisus*), malar space, scapi, inner frontal orbits, outer orbits. Long silvery hairs on mandibles, clypeus, face, temple, gena and vertex. Lower frons polished, with transverse wrinkling, concave, in some specimens with a deep fossa medio-dorsad of antennal sockets. Upper frons coriaceous to almost polished, seldom slightly rugose around the ocelli. OOL-region almost polished. OOL : diameter of posterior ocellus, 1 : 1, 9 : 7, 5 : 4. Tyloidea on antennal segments 19—23.

Thorax black, with conspicuous yellow-ivory markings: pleuron 1, anterior and posterior margin of notum 1, tegulae, centre of mesonotum, scutellum 2, epimeron 2, front and middle coxae and trochanters. The whole thorax covered with suberect to erect pilosity of varying length. Epomia weak. Propodeum with both transverse carinae, propodeal spiracle elliptic. Wings subhyaline to somewhat infuscate. Areola with narrow anterior side and converging cubital cross veins (2rm and 3rm). Legs with front and middle femora, tibiae and tarsi orange to orange-yellow. Hind coxae fuscous, hind femora with fuscous base or a fuscous spot, hind tibia brownish, tarsus of hind leg with the following segments white: basitarsus (half), 2, 3, 4, 5 (partly or wholly). Indices of femora: 5.0—5.9 (1), 6.3—6.6 (2), 5.2—5.9 (3).

Petiole of gaster fuscous (in some specimens the postpetiole as well), following segments orange with fine, alutaceous microsculpture.

A set of specimens was described by Tschek (1870a: 121—122) as *C. incisus*. The nomenclatorial aspects of this name were dealt with in my paper on the genus *Meringopus* (van Rossem, 1969). What remains is their identity — all males. After prolonged comparison I think the most plausible inference is that these specimens represent a form of the *Cryptus armator* male, lacking the rich yellow coloration, especially of the face, notum 1 and front coxae. All syntypes have a character on which Tschek based his species: the lamelliform hypostomal and genal carinae which do not meet. When leaving these two characteristics out of consideration (the yellow marking and the “*incisus*” aberration), the specimens agree well with the *C. armator* male. They all show the rich long grey pilosity on the temple and gena, the same sculpture of the episternum 2 and a similar shape of the propodeum. The propodeum is so flat, with the transverse carinae rather widely separated, that it recalls the genus *Mesostenus*. However, the areola is more reminiscent of the *Cryptus* type, with its broad anterior side. Finally the thorax of the *C. incisus* syntypes shows the conspicuous long pilosity, so characteristic of the *C. armator* male.

At present it is impossible to elucidate this form of *C. armator*. Several males of the latter show the lamelliform hypostomal carina, though I have been unable to find specimens with the “*incisus*” character. However, it should be mentioned that this character is not at all uncommon in *Cryptines*.

Characteristics of the lectotype of *Cryptus incisus*. Male, 13.5 mm. Front wing 9.5 mm. Labels: a discoloured white tag “20.5 (18) 68”, a white tag “Type” (red ink, Tschek’s writing), a printed label “Tschek 1872 Piesting”, a white tag “*pseudonymus*”. *Cryptus armator* f. *incisus* det.

Head black, labrum ivory, mandibles for the greater part yellow, inner and outer orbits with yellow lining. Face with conspicuous grey hairs. Facial convexity strong. Lower frons concave, antennal scrobes polished. Upper frons weakly rugose. OOL : diameter posterior

ocellus, 1 : 1. Temple and gena polished but with rather dense punctures from which erect grey, long hairs arise. Genal carina not running into hypostomal carina, both these carinae lamelliform, thus a conspicuous gap remains between them (this is the character which Tschek meant by "inciso-lobatis").

Thorax black; anterior margin of notum 1, vague spot on scutellum 2 and subalar prominence, marked yellow. Thorax except propodeum rather finely sculptured. Episternum 2 polished, with some striking dorso-ventral wrinkles. Propodeum with both carinae, rough longitudinal wrinkling between. Index of propodeal spiracle 2.5, long elliptic in shape. The whole thorax covered with conspicuous grey, suberect to erect pilosity. Wings subhyaline, areola relatively large, anterior side about as long as the outer converging side. Front coxae ferruginous, middle and hind coxae black. All femora orange, indices 4.6 (1), 5.9 (2), 5.6 (3). Front tibia not inflated. The following parts of hind tarsus white: half the basitarsus, segments 2, 3 and 4.

Gaster with black petiole, postpetiole and following tergites orange.

One other syntype was labelled paralectotype.

Biology. — Nuorteva and Jussila (1967) report about *C. armator* (= *C. albatorius* auct.) as a parasite of *Oporinia autumnata* (Bkh.) (Lep.) in subarctic birch forests.

Material examined. — Austria: 8 ♀, Piesting, leg. Tschek, with the following dates: 8.VI; 11.VI; 19.VI; 26.VII; 15 and 30.VIII; 1866; 18.VI.1867; 30.V.1869; ♀, no date, leg. Tschek; ♀, "Tuni" (?), 1869, leg. Tschek; 5 ♂, Piesting, leg. Tschek, with the following dates: 12.VI.1865; 27.V.1866; 10.VIII.1866; 17.V.1867; 26.V.1870; ♂, Wand, 9.VI.1865, leg. Tschek; 5 ♂, no data, leg. Tschek. All from NMW. ♂, Esternberg, 22.VII.1964, coll. den Hoed. Czechoslovakia: ♀, Moravia, Dom. Scott, coll. Fabricius (the lectotype of *C. armator*) (MC). Denmark: ♀, VI.1965, leg. den Hoed. Germany: ♀, locality illegible, 24.VI.1905, coll. Dittrich (under *C. australis*) (ZI); ♂, locality illegible, leg. Brade (ZI); ♂, Hildesheim, coll. Wüstnei (MC); ♂, Blankenburg (Thür.), leg. Schmiedeknecht, coll. Dittrich (ZI). Italy: ♂, Bolzano, 1913, leg. Smits van Burgst (ELW). Netherlands: ♀, Epen (Zd.L.), VIII.1926, coll. Lindemans (MR). Poland: ♀, Sobotka (Zobten), 15.VI.1917, coll. Dittrich (as *C. pseudonymus*) (ZI); ♀, Sobotka (Zobten), 1895, coll. Dittrich (as *C. australis*) (ZI); ♂, Sobotka (Zobten), 17.VI.1917, coll. Dittrich (ZI); ♀, Grünberg, coll. Dittrich (ZI).

*Cryptus armator* f. *incisus*: ♂, Piesting, 20.V.1868, leg. Tschek (the lectotype of *C. incisus*); 3 ♂, Piesting, 27.VIII.1866; 26.V.1867; 20.V.1868; ♂, no data, leg. Tschek (NMW).

### *Cryptus titubator* (Thunberg, 1822)

*Ichneumon titubator* Thunberg, 1822, Zap. imp. Akad. Nauk. 8: 270.

*Cryptus difficilis* Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 117.

*Cryptus infumatus* Thomson, 1873, Opusc. ent. 5: 481.

Roman (1912) identified Thunberg's type specimen and showed Thomson's *Cryptus infumatus* to be the same species. Confusion arose from Roman's remark "Diese Form ist, (.....), von *C. albatorius* (Grav.) Tschek (= auct.) kaum artlich getrennt". That this is not the case was demonstrated by Perkins (1942), who gave useful characters for the separation of *C. albatorius* (Vill.) and *C. infumatus* Thomson, 1873.

The holotype of *Ichneumon titubator* is a female in Thunberg's collection in the Zoological Institute of the Uppsala University. The specimen was kindly sent to me by Mr. Sten Jonsson.

Characteristics of the holotype of *I. titubator*. Female, 7.4 mm. Front wing 5.5 mm. Labels: the specimen bears only one label in ink with Roman's handwriting "*Cryptus titubator* Thbg". Holotype labelled accordingly.

Head and antennae rufous (colour not uncommon in Scandinavian Cryptines). Index of postanellus 6.0. Mandibulae rufous, labrum yellowish brown. Clypeus and facial convexity strongly developed. Face finely coriaceous with adpressed grey hairs. Frons alutaceous, somewhat concave on its lower half. Gena polished, with fine punctures. Inner and outer orbits with yellowish markings.

Thorax rufous. Epomia strong. Mesoscutum polished with fine regular punctures. Episternum 2 closely punctured to rugose. Propodeum with horizontal part more or less alutaceous, sloping part and pleural regions finely rugose. Anterior propodeal carina weak sublaterally, posterior carina medially weak, sublaterally developed into weak teeth. Wings slightly infusate. Areola small, sides strongly convergent. Legs with all coxae and trochanters rufous. Femora and tibiae I and II orange. All tarsi and tibiae III reddish brown.

Gaster orange. Tergites finely alutaceous. Ovipositor 2.2 mm, about as long as the hind tibia, 0.40 of front wing.

Description of the female. — Body length 7.0—10.3. Front wing 5.6—8.5 mm. Head ferruginous to black, inner and outer orbits yellow-ivory, labrum light brown. Head with short adpressed grey bristles. Antennal scrobes concave, polished, relatively large (Fig. 41 and 42). Upper 0.4 of frons with dense, alutaceous microsculpture, less concave than in *C. armator*. Temple and gena polished, with rather widely spaced fine punctures.

Thorax ferruginous to rufous, or black, anterior margin of notum 1 and subalar prominence yellow to reddish brown. Epomia in some specimens relatively strong. Both propodeal carinae present; the posterior medially straight. Sublateral parts of propodeum before the anterior carina mostly subpolished to polished. Propodeal spiracle elliptic to short elliptic. Wings subhyaline to somewhat infusate. Areola with sides rather converging (Pl. 1 Fig. 1). Legs with coxae almost orange (in strongly rufous specimens) to black. All femora, front and middle tibiae orange, hind tibia more brownish. Indices of femora; 4.7 (1), 4.9—5.0 (2), 5.0—5.2 (3). Front tibia slightly inflated.

Gaster with petiole mostly fuscous, postpetiole and following segments in most specimens orange. Ovipositor 0.35—0.40 length of front wing.

Male. — For description of the *C. titubator* male I have used three specimens which were kindly sent to me by Dr. J. F. Perkins (London).

Body length, 8.0—8.9 mm. Front wing 6.0—6.5 mm. Labels: England SD, Newton Abbot, 10.VI.1941, J. F. Perkins<sup>1</sup>).

Head black. Scapus with a yellow spot, antennae black somewhat rufous. Index of postanellus 3.8. Tyloidea on antennal segments 17—20 or 17—21. Labial and maxillary palpi yellow. Mandibulae yellow with dark red apices. Clypeus polished with yellow spot centrally. Face alutaceous with central convexity marked yellow. Facial orbits broadly yellow. Antennal scrobes polished. Lower 0.5 of frons weakly concave. Upper 0.5 of frons alutaceous. OLL-region on about the same plane as the compound eye. The entire ocellar region rather convex. Vertex and temple with somewhat adpressed silvery-grey pilosity. Gena polished, with long erect hairs. Outer orbits with narrow yellow marking.

<sup>1</sup>) Later I found a series of 15 males of this species from Bolzano (Italy) (ELW), these specimens agree well with the English material. The variation mentioned in item 27 of the key to the males is based on the Bolzano specimens.



Thorax black, covered with greyish hairs, short in the dorsal regions, long in the pleural regions. Anterior margin of pronotum, tegulae and subalar prominence marked with yellow. Epomia present. Mesoscutum shiny between the punctures. Episternum 2 closely punctured, somewhat rugose. Propodeum with anterior transverse carina developed, posterior carina present, but poorly developed. Wings subhyaline to slightly infusate. Areola small, sides strongly convergent (Pl. 1 Fig. 1). Legs with coxae I brownish with ivory spots. Coxae II brown, sometimes with small ivory spot. Coxae III and trochanters brown. Trochanters I and II with ivory spots. Femora, tibiae and tarsi I and II orange with exception of segment 5 of tarsi II. Femora III orange, tibiae III, including the basitarsus reddish brown. Tarsal segments 2, 3 and 4 of hind leg white, segment 5 brown.

Gaster with first segment slender, about  $3.3\text{--}5 \times$  longer than wide distally. Tergites 2 and 3 red to dirty red, rest of tergites reddish to infusate. Genital claspers dark brown.

Tschek (1870: 117—118) did not mention the number of specimens he had of *Cryptus difficilis*, but he did possess males and females. The material which I received from Dr. Fischer comprises one female and three males. The males were labelled "*albatorius* var. *difficilis* Tschek" by Habermehl, but they are all *C. armator*. The remaining female I selected as the lectotype.

Characteristics of the lectotype of *Cryptus difficilis* Tschek. Female, 7.1 mm. Fore wing, 5.4 mm. Labels: 17.V.1867; a label "Type" in red; a label "*difficilis* m"; a label of Habermehl "*Cryptus albatorius* v. *difficilis* Tschek". Lectotype labelled accordingly and hereby designated as such. Antennae both missing. The specimen agrees with the holotype of *C. titubator* (Thunb.) (Fig. 41 and 42).

According to information received from fil.lic. H. Andersson, the type series of *Cryptus infumatus* Thomson comprises 8 specimens from Sweden. As the lectotype I selected a ♀ specimen from Pålso.

Characteristics of the lectotype of *Cryptus infumatus* Thoms. Female, 6.7 mm. Fore wing 6.2 mm. Labels: a small white tag "Pål" (= Pålso, Skåne); no 4/1968. Lectotype labelled accordingly and hereby designated as such. The specimen agrees with the holotype of *C. titubator* (Thunb.).

Material examined. — Austria: ♀, Piesting, VIII.1870, coll. Tschek (dubious specimen) (NMW); ♀, Piesting, 17.V.1867, coll. Tschek (lectotype of *C. difficilis*) (NMW). England: 3 ♂, SD., Newton Abbot, 10.VI.1941, leg. J. F. Perkins (BM). Germany: ♀, Saalburg, 24.VII.1915, coll. Dittrich (ZI); ♀, Halisch (?), VI.1879, coll. Dittrich (ZI). Italy: ♂, Villnöss (Funes), prov. Bolzano, 1100—1400 m, 13.V.—30.V. 1965, leg. van Rossem (PD); 15 ♂, Bolzano, 1914, coll. Smits van Burgst (ELW). Netherlands: ♀, Burgst (NB), VIII.1915, leg. Smits van Burgst, coll. Koornneef (det. *C. albatorius*) (ELW); ♀, Velp (Gld), 2.VIII.1942, coll. Koornneef (ELW); ♀, Velp (Gld), 6.VI.1940, coll. Koornneef (ELW); ♀, Kruisbosch bij Landsrade (Zd.L.), 1—9.VI.1943, leg. G. van Rossem (PD); ♂ ♀, Epen (Zd.L.), VIII.1926, leg. et coll. Lindemans (both identified as *C. diana*) (MR). Sweden: ♀, Scan (Scandinavia), no 3/1968, coll. Thomson (ML); ♀, Skåne, Pålso, coll. Thomson (lectotype of *C. infumatus*) (ML); ♀, no locality, no date, coll. Thunberg (holotype of *Ichneumon titubator*) (UU); ♀, Torne, Lappmark, Vadvetjakko, 19.VII.1955, leg. Jeekel and Piet (MA); ♀, Torne, Lappmark, Abisko, 22.VII.1955, leg. Jeekel and Piet (MA). No date: ♀, coll. Schmiedeknecht (as *Cryptus australis* Tschek) (ELW); ♀, (as *C. albatorius*) (ELW).

*Cryptus baeticus* Seyrig, 1928

*Cryptus baeticus* Seyrig, 1928, Eos 4: 378—379.

A paratype of *C. baeticus* is in Habermehl's collection at Frankfurt (Main). The specimen is undoubtedly original.

Characteristics of the paratype of *C. baeticus*. Male of 11.3 mm. Front wing 7.8 mm. Labels: a red label "cotype", a white label "Sierra Morena, Fuente ovejuna 12.VI.1927 A. Seyrig", a white tag "coll. Habermehl", a red museum label "co-Type", a white label "*Cryptus baeticus* m. ♂ det. A. Seyrig". Lectotype hereby designated and labelled.

Head orange, with black in a spot round the antennal sockets, on the malar space and the entire part of the head beyond the genal and occipital carina. Inner orbits marked with yellow. Palpi light brown with some dirty white. Labrum yellow. Clypeal and facial convexity shown, but flat. Entire face alutaceous with fine close punctures. Base of mandibles and the face covered with conspicuous silvery, abpressed hairs: Lower 0.5 of frons highly polished. Medial and ocellar region of frons with fine wrinkling. Vertex, temple and gena polished, with fine punctures, implantations of silvery hairs. Antennae with orange coloured globuliform scapus, flagellum light brown. Tyloidea on antennal segments 19—22. OOL : distance between inner margins of compound eyes (on vertex), 1 : 5. OOL : diameter posterior ocellus, 1 : 1. Gena (at base of eye) : breadth of compound eye, 5 : 6, hence not broad.

Thorax black, with the following parts orange to red: notum 1 dorsally and ventral margin. Anterior margin of notum 1 beyond the head yellow. Mesoscutum, scutellum 2 and notum 3 medially orange, but the entire anterior and lateral margin (down to wing base) and prescutal sutures conspicuously black. Episternum 2 with orange spot under subalar convexity and ventrally towards sternaulus. Subalar convexity yellow, speculum vaguely yellow. Mesoscutum polished, with regular punctures in the lateral parts. Notum 1 with rather conspicuous longitudinal wrinkles. For the rest the thorax is densely and roughly sculptured and covered with adpressed silvery bristles, which give the specimen a brilliant appearance. Both propodeal carinae present but rather obliterated. Posterior carina sublaterally developed into small sharp teeth. Propodeal spiracle oval, index 2. Wings subhyaline. Areola relatively small, with strongly converging sides. Nervulus antefurcal. Legs slender, with all coxae brilliantly orange. Trochanters blackish. Femora orange. Tibiae ranging from yellow (front) to somewhat fuscous (hind). Basitarsus and base of second tarsal segment of the hind leg fuscous, segments 3 and 4 white, 5th segment fuscous.

Gaster orange, rather shiny, with fine alutaceous sculpture and rather long adpressed pilosity. Apex of clasper somewhat fuscous, rounded truncate. First gastral segment long and slender. Cubital (M + Cu-1) : first gastral segment, 1 : 1.

Female. — Unknown to me.

Remark. — I have not been able to determine the exact identity of this single specimen. There is no doubt that it is close to *C. armator* and *C. titubator*. It might be an orange form of either of the two.

Material examined. — Spain: ♂, Sierra Morena, Fuente ovejuna, 12.VI.1927, leg. A. Seyrig, coll. Habermehl, No SMF: H 1202, lectotype of *C. baeticus* (SM).

THE *Cryptus inculcator* GROUP

Three species: *C. leucocheir*, *C. inculcator* and *C. apparitorius* belong to — what I would name — the *Cryptus inculcator* group. *C. inculcator* is a common and wide-spread species which may have a tendency to split up, possibly under influence of host selection. *C. inculcator* and *C. apparitorius* are undoubtedly so closely related that nobody would dispute their being regarded as forms of one species. Both are parasites of lepidopterous larvae.

*C. leucocheir* a parasite of a sawfly and takes a more remote position. Some interesting facts on the biology of this large species are known.

KEY TO THE FEMALES IN THE *Cryptus inculcator* GROUP

1. Size generally large, body, 14.4—15.1 mm. Front wing 10.8—11.7 mm. Index of postanellus about 5.0. Coxae ferruginous (not bright orange). Index of propodeal spiracle 3.0—3.2. Gaster subpolished, with very regular alutaceous microsculpture. Ovipositor with flattened tip (Fig. 46) . . . . . *C. leucocheir*
- Smaller specimens up to 12.0 mm. Front wing up to 8.8 mm. Index of postanellus between 4.0—5.0. Index of propodeal spiracle between 1.5—3.0. Gaster not subpolished but with regular, somewhat more developed microsculpture. Tip of ovipositor with more pronounced nodus (Pl. 1 Fig. 3 and 4). One species with the coxae bright orange, the other with coxae fuscous . . . . . 2
2. Coxae bright orange to dirty red. Propodeal spiracle broad elliptic, index 2.0—3.0. Scutellum 2 never marked with ivory-yellow (Pl. 1 Fig. 4) . . . . *C. inculcator*
- Coxae fuscous, tending to ferruginous. Propodeal spiracle subcircular, index 1.5—2.0. Scutellum 2 mostly marked with ivory-yellow (Pl. 1 Fig. 3) . . . *C. apparitorius*

*Cryptus inculcator* (Linné, 1758)

*Ichneumon inculcator* Linné, 1758, Systema Naturae, ed. decima: 565, ♀ (no 45).

*Ichneumon sponsor* Fabricius, 1793, Entomologia Systematica 2: 153, ♀ (no. 80).

*Cryptus quadrilineatus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 535, ♂ (no 81).

Roman (1932) showed the co-identity of *Ichneumon inculcator* Linné, 1758 and *Ichneumon sponsor* Fabricius, 1793. Since the time of Gravenhorst this conspicuous *Cryptus* species has been known by the name of *Cryptus sponsor*, usually with Gravenhorst as the author (Taschenberg, 1865: 85), though Gravenhorst clearly stated Fabricius to be the author.

Characteristics of the lectotype of *Ichneumon inculcator*. Female, 13.5 mm. Front wing 9.7 mm. Labels: 45. *Inculcator*, lectotype labelled accordingly. Head with inner and outer orbits not marked with yellow.

Thorax. Axillary vein in hind wing parallel to hind margin of wing. All legs, including coxae, ferruginous to orange. Hind tibia more fuscous.

Gaster with petiole black, following tergites orange. Ovipositor missing.

Description of the female of *C. inculcator*. Front wing 6.5—8.5 mm. Body size 8.3—11.5 mm.

Head black. Antennae rufous to black, segments 7—11 white dorsally, markings sometimes reduced or absent. Index of postanellus 3.8—5.0. Labrum light brown. Mandible at base with adpressed hairs, central part with conspicuous, long, erect hairs. Face with



conspicuous adpressed grey pilosity, lacking on clypeus and central convexity. Clypeus in fresh specimens shiny, with erect hairs. Frons moderately concave, lower 0.5 polished, with transverse wrinkling (Fig. 31). Upper 0.5 rugose towards ocelli. POL : OOL, 4 : 3. Diameter lateral ocellus : OOL, 1 : 1. The narrow OOL is a conspicuous character. Inner and outer orbits with or without white markings. Temple and gena polished, with fine punctures, implantations of fine adpressed pilosity. Gena broad. Breadth compound eye : breadth gena (from base of compound eye to meeting point of genal and hypostomal carinae), about 5 : 4.

Thorax black. Notum 1, episternum 2 with conspicuous longitudinal wrinkling, which is sometimes absent for the greater part. Epomia present. The following parts of the thorax may show yellow markings : anterior margin of notum 1, two vague spots on posterior margin of notum 1 (almost at point where epomia meets the posterior margin), subalar prominence (vague). Most specimens have an entirely black thorax. Propodeum roughly sculptured. Index of propodeal spiracle 2.0—3.0. Anterior transverse carina present or (partly) absent, posterior transverse carina mostly complete, bluntly dentate sublaterally. Legs ranging from partly fuscous to entirely bright orange, including the coxae. Areola Fig. 25.

Gaster with the petiole usually black and the remainder bright orange to rufous. All tergites with fine, regular sculpture and short adpressed hairs. Ovipositor comparatively stout; about half the length of front wing. Tip of ovipositor, Pl. 1 Fig. 4.

Description of the male of *C. inculcator*. Front wing 7.0—9.0 mm. Body length: 10.0—13.5 mm.

Head black. Antennae black, with tyloidea on segments 17—21, scapus rufous to black, almost globuliform, pubescent. Labrum whitish, labial and maxillary palpi light brown. Mandibulae white at base, apices brown; with some greyish white hairs centrally. Face with adpressed grey pilosity, convexity marked with yellow to ivory. Clypeus well-defined, shiny, sometimes with whitish spot, with some scattered punctures and some conspicuous erect hairs in the central region. Inner and outer orbits ivory. Antennal scrobes polished, frons rugose. POL : OOL, 11 : 6 (11 : 7) (9 : 6). Diameter lateral ocellus : OOL, 7 : 6 (1 : 1). Temple and gena polished, with regular punctures, implantations of fine, adpressed grey pilosity.

Thorax black, conspicuously marked with ivory: anterior margin of notum 1, entire posterior margin of notum 1 (with medial interruption), tegulae, subalar prominence, central spot on mesoscutum (often obliterated by the pin!), scutellum 2, notum 3 centrally, propodeum with ivory lining of posterior transverse carina and broad sublateral extensions on either side of propodeal orifice towards the hind coxae. All these spots are subject to variation. Notum 1 and episternum 2 with or without longitudinal wrinkling. Epomia present. The whole thorax covered with short adpressed (here and there somewhat erect) grey bristles. Speculum polished. Propodeum roughly sculptured, both transverse carinae well-developed. Legs with coxae varying from dark rufous to bright orange. Coxae I sometimes with ivory spots, tibia I and II dorsally with vague whitish colour. Hind tibia apically and basitarsus fuscous, tarsal segments 2, 3 and 4 of hind leg white, segment 5 fuscous. Left front wing Fig. 15.

Gaster orange, petiole and apical segments sometimes tending to fuscous.

Characteristics of the lectotype of *Ichneumon sponsor*. Female, 12.9 mm. Front wing 9.3 mm. Labels: "*sponsor*" (in Fabricius' writing), lectotype hereby designated and labelled. A dirty specimen, antennae lost beyond pedicel, left middle leg and most of

tarsi missing. All coxae and femora reddish. Index propodeal spiracle 3.0. Ovipositor half the length of front wing.

*Cryptus quadrilineatus* Gravenhorst, 1829, was placed under *C. attentorius* Grav. (= auct.) by Taschenberg (1865: 79), but this is undoubtedly wrong. Schmiedeknecht (1890: 100 and 106) synonymized *C. quadrilineatus* with *C. sponsor* (F.).

Characteristics of the lectotype of *Cryptus quadrilineatus*. Male, 11.0 mm. Labels: none; lectotype herewith designated and labelled. The specimen belongs to *C. inculcator* (L.). Thorax with all coxae rufous to orange.

Table 1. Indices of postanellus and propodeal spiracles of 9 females of *C. inculcator*.

	postan.	prop.sp.
Wartha, 16.VII.1884 (ZI)	4.5	3.0
coll. Schmiedeknecht (ELW)	4.0	2.3
Aalbeek, 15.VI.1917 (ELW)	5.0	2.2
Amf. VII.1911 (ELW)	5.0	2.3
Pracchia (Italia) (RMNH)	4.2	2.2
Hain 19.VII.1882 (ZI)	4.6	2.7
Eijgelshoven, VII.1929 (ELW)	4.4	2.5
Gulpen, 31.VII.1927 (ELW)	4.5	2.0
Halisch, 27.VII.1879 (ZI)	4.2	2.2

Distribution. — *C. inculcator* is widely distributed in the Palearctic region (Meyer, 1934: 44; Townes, 1965: 184).

Biology. — Schmiedeknecht (1931: 57—58) and Meyer (1933: 34) give *Panolis griseovariegata* (Goeze, 1781) (Lep.) as the host.

Material examined. — ♀, the Linnean lectotype, no labels (Linnean Society, London). No data: ♀, coll. Schmiedeknecht (ELW). Germany: ♀, the Fabrician lectotype (MC); ♂ lectotype of *C. quadrilineatus*, no labels; ♂, locality illegible, 10.VII.1879 (coll. Dittich) (ZI); ♂, locality illegible, 20.VII.1879 (coll. Dittich) (ZI); ♀, Hain, 19.VII.1882 (coll. Dittich) (ZI); ♀, Halisch, 27.VII.1879 (coll. Dittich) (ZI); ♀, Wartha, 16.VII.1884 (coll. Dittich) (ZI); ♀, Bad Tölz i.B., VII.1929, coll. Lüdeke (DEI). Israël: ♀, Matta, 15 km SW of Jerusalem, 16.V.1967, leg. C. A. W. Jeckel (MA). Italy: ♀, Pracchia, 650 m, 15—20.VI.1955, leg. J. van der Vecht (RMNH); ♂, Bolzano, 1914, leg. Smits van Burgst (ELW). Netherlands: ♀, Gulpen, 31.VII.1927, leg. Bouwman (coll. Koornneef) (ELW); ♀, Aalbeek, 15.VI.1927 (coll. Koornneef) (ELW); ♀, Eijgelshoven, VII.1929, leg. Willemse (coll. Koornneef) (ELW); ♀, Amersfoort (?), VII.1911 (coll. Koornneef) (ELW); 3 ♀, Putten, 16.VI.1919, 24.V.1920, 6.VII.1921, leg. J. Th. Oudemans (MA). Poland: ♀, Ndl Lobodno p. Czesochowa, 18.VI.1949; 9 ♀, Podkowa Lesna p. Warszawa, 15.VII.1950, 19.VI.1952, 15.VII.1952, VII.1952, 15.VI.1955, 12.VII.1956, 30.VII.1956, 8.VIII.1956, 19.VII.1958, all from the collection of J. Glowacki; 6 ♂, Podkowa Lesna p. Warszawa, VI.1953, 23.VI.1955, 10.VI.1955 (2 spec.), 4.VII.1956, no date, leg. Glowacki. Switzerland: ♀, Valais, la Sage, Val d'Hères, 1700 m, 11.VIII.1960. leg. L. D. Brongersma (RMNH).

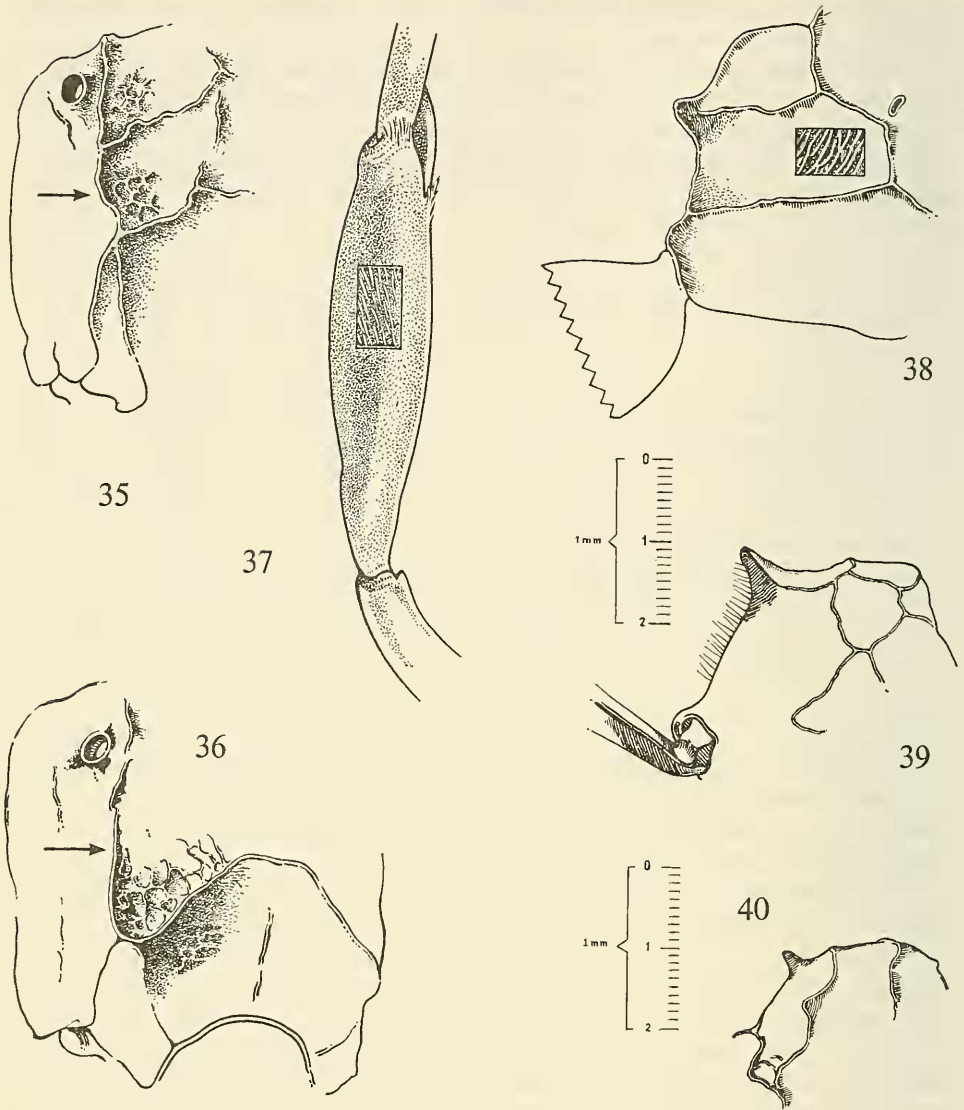


Fig. 35—36. Propodeum with lateral longitudinal carina (arrow) of *Cryptus*: 35, *C. fibulatus* Grav., ♂, Crefeld, leg. Ulbricht, paralectotype of *C. rhenanus*; 36, *C. moschator* (F.), ♂, Krietern, 17.V. 1885, coll. Dittrich (ZI). Fig. 37, *C. tuberculatus* Grav., ♀, Weidenhof, 10.VI.1902, coll. Dittrich (ZI), left front tibia. Fig. 38, *Apsilops cinctorius* (Grav.), ♀, Leiden, IX, leg. van Vollenhoven (ELW), right lateral view of propodeum, pleural carina (lower) and lateral longitudinal carina (upper). Fig. 39, *C. spinosus* Grav., ♀, Valle di Toscolano, 10.V.1964, coll. van Ooststroom, lateral view of propodeum, with pattern of transverse carinae and sublateral horn (left). Fig. 40, *C. spinosus* Grav., ♂, Pålso, coll. Thomson, no 18/1968, ML, propodeum from the right with sublateral horns



*Cryptus apparitorius* (C. de Villers, 1789)

*Ichneumon apparitorius* C. de Villers, 1789, Caroli Linnaei Entomologia, Faunae Suecicae descriptionibus 3: 143 (type lost).

*Cryptus pungens* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 505, ♀ (no 56).

*Cryptus gratiosus* Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 122, ♂ ♀.

The identity of *Ichneumon apparitorius* de Villers, 1789, is obscure since the type is lost. The name *Cryptus apparitorius* entered literature through the interpretation of Gravenhorst, but it is clear that he is not the author of the name. To serve stability in nomenclature I think it best to retain the specific combination *Cryptus apparitorius* (de Villers, 1789). The author's description of this species, though short, is not in conflict with the actual interpretation of *Cryptus apparitorius* of authors. For this reason the indication of a neotype seems justified and the best specimen to choose for this purpose is Gravenhorst's first specimen, the one upon which other authors' interpretations are based.

Characteristics of the neotype of *Ichneumon apparitorius*. Female, 9.2 mm. Front wing 7.6 mm. Labels: none. Neotype hereby designated and labelled.

Head black. Labrum ivory, inner and outer orbits with ivory-yellow lining. Face with adpressed hairs, facial convexity pronounced. Index postanellus, 4.6, antennae with white band. Lower frons (antennal scrobes) somewhat concave. Upper frons somewhat rugose.

Thorax black, yellow marking as follows: anterior margin of notum 1, spots on medial posterior margin of notum 1, scutellum 2, notum 3, subalar prominence. Entire thorax with adpressed, grey bristles. Index propodeal spiracle 1.7. Both propodeal carinae present. Front tibia somewhat inflated. Index front femur, 3.7.

Gaster orange, except the petiole; finely alutaceous. Tip of ovipositor Pl. 1 Fig. 3.

Description of the female. — Body length 8.5—9.6 mm. Front wing 6.5—7.7 mm. Head black, face with adpressed grey hairs. Facial convexity pronounced (in comparison with *C. inculcator*). Index of postanellus, 4.1—4.5. Antennal scrobes slightly concave; upper frons somewhat rugose. Ivory-yellow markings on labrum as well as on inner and outer orbits. Antennae white banded.

Thorax black, ivory-yellow marking may occur on: anterior margin of notum 1, spots on medio-posterior margin, scutellum 2 and notum 3 (scutellum 2 and notum 3 are always black in *C. inculcator*), subalar prominence. Thorax with grey, adpressed hairs. Wings subhyaline. Anterior side of areola rather broad, about equal to outer converging side. Shape of areola on the whole differing from *C. inculcator* (Fig. 9 and 25). Index of propodeal spiracle 1.5—2.0 (subcircular). Both propodeal transverse carinae present. Legs with coxae and trochanters ferruginous (not orange as in *C. inculcator*). Femora, front and middle tibiae bright orange; tibia 3 more fuscous. Femora relatively stout, index front femur, 3.7—4.1.

Gaster orange, except for petiole. Tergites finely alutaceous. Ovipositor about half the length of front wing (as in *C. inculcator*). Tip of ovipositor not essentially differing from *C. inculcator* (Pl. 1 Fig. 3 and 4).

Male. — The type series of *C. gratiosus* in Vienna comprises a male which rather resembles the male of *Cryptus inculcator* but shows a character separating it from the latter: the almost circular propodeal spiracle, index 1.6 (*C. inculcator*, 2.6). As only this male was available at the time, it served for the description.

Specimen of 8.9 mm. Front wing 6.2 mm. Labels: 20.5.68 (1868) (written), Type

(in red ink), Tschek 1872, Piesting (printed), *Cryptus gratiosus* Tschek ♂ Prof. Habermehl det., paralectotype *C. gratiosus*, labelled as such.

Head black. The following parts ivory: all palpi, labrum, mandibles (except the teeth), clypeus, face (except a narrow line above clypeus), frontal orbits, outer orbits and part of scapus. Tyloidea on antennal segments 14–19. Antennal scrobes polished (about 0.5 of frons), upper central part of frons rugose. Inner orbits and OOL-region almost polished. Vertex polished with adpressed, short, rather close pilosity. Head broad behind the eyes.

Thorax black. The following parts ivory: pleuron 1, anterior and posterior margin of pronotum, tegulae, central spot on mesoscutum, scutellum 2, central area of metanotum ("postscutellum"), notum 3 laterally, a broad margin along posterior transverse carina, subalar prominence, speculum, spot along sternaulus, spot on epimeron 3, all coxae spotted, trochanters I and II, tarsal segments 2, 3 and 4 of hind leg. Femora, tibiae and tarsi of front and middle legs orange-yellow. Femora III orange; tibia III apex, basitarsus and tarsus 5 fuscous. Epomia present, both transverse propodeal carinae well-developed. Propodeal spiracle index 1.6. Thorax, including all coxae, with rather conspicuous grey pilosity. Areola, Fig. 9.

Petiole of gaster ferruginous. Postpetiole and other segments orange.

Gravenhorst when describing this species first used de Villers' name for it and then, a few pages further, used the binomen *Cryptus pungens* in a description of the same species. The type series of *C. pungens* comprises two females (Gravenhorst, 1829: 506), of which the first was taken at Vratislavia (Wroclaw), the second with the 7th segment "nigro" from Austria. My investigations of these two specimens disclosed the first to be *Cryptus apparitorius* auctorum, the second one with the 7th segment "nigro" is *Caenocryptus inquisitor* (Tschek, 1870a). I have labelled the first specimen as the lectotype of *Cryptus pungens*. For easy identification I have labelled the second specimen paralectotype, adding a label: *Caenocryptus inquisitor* (Tschek, 1870).

Characteristics of the lectotype of *Cryptus pungens*. Female, 9.8 mm. Front wing 7.2 mm. Labels: none. Lectotype hereby designated and labelled. A rather dirty specimen with hairs imperfect.

Head black. Palpi and labrum light brown. Antennae missing beyond 10th and 11th segments. Segments 8–10 (11th in part) marked with white. Index of postanellus 4.1. Clypeus and facial convexity strongly convex. Lower 0.5 of frons concave, polished, with transverse ridges. Frontal orbits alutaceous. Upper 0.5 of frons with some regular rugosity along the median line and lateral of anterior ocellus. OOL : POL, 3 : 4. OOL conspicuously narrow; diameter posterior ocellus: OOL, 1 : 1. Gena gradually widening towards mandibular base. Breadth gena (at base of compound eye) : breadth compound eye, 4 : 5. Inner and outer orbits with yellowish markings.

Thorax black, anterior margin of notum 1 with yellowish spot; scutellum marked yellow. Epomia present. Mesoscutum polished, with fine punctures. Prescutal sutures strongly developed. Pleural regions and propodeum roughly sculptured to rugose. Anterior propodeal carina present, but somewhat obliterated; posterior carina strong, showing weak sublateral dentation. Index propodeal spiracle 1.7. Left front wing missing. Wings subhyaline. Anterior side of areola somewhat shorter than outer converging side. Legs with coxae and trochanters ferruginous. All femora and tibiae I and II orange. Apex of tibia III and tarsi brownish red. Index of tibia I, 5.4.

Gaster orange red, except base of petiole. All tergites regularly and finely alutaceous. Ovipositor 3.7 mm.

The type series of *Cryptus graciosus* comprises four males and one female (Tschek, 1870a: 122). Of these I have studied only one male and the single female. I select the female as the lectotype.

Characteristics of the lectotype of *Cryptus graciosus* Tschek. Female, 8.5 mm. Fore wing 6.5 mm. Labels: 25.V.68 (1868). "Type" (red ink); "*Cryptus graciosus* Tschek ♀ det. Habermehl".

Head black. All palpi light brown. Labrum whitish. Left antenna missing beyond pedicel; right antenna missing beyond 12th segment. Scapus rufous. Antennal segments 8—11 for the greater part white. Index of postanellus, 4.1. Facial aspect of head round. Convexities of clypeus and face strong.

Thorax black. Anterior margin of notum 1 and scutellum 2 marked ivory. Anterior transverse carina of propodeum rather obliterated. Index of propodeal spiracle, 2.0. Entire thorax covered with conspicuous grey, short, adpressed pilosity. All coxae tending to rufous.

Gaster bright orange, except for lateral parts of petiole. Ovipositor, 0.47 length of front wing.

Remark. — Bauer (1958: 452) placed this species in *Caenocryptus*, but I cannot agree with this. The propodeal spiracle of true *Caenocryptus* is absolutely circular and very small (see page 304). Small specimens of *C. apparitorius* should not be confused with *Caenocryptus rufiventris* (Grav.). In the latter species, apart from the shape of the propodeal spiracle, the second gastral tergite shows clear punctures between microsculpture.

Biology. — According to Schmiedeknecht (1931: 60—61) Oudemans bred this species from *Ypsolophus* (*Cerostoma*) *parenthesellus* (Linné, 1761) (Plutellinae).

Material examined. — Austria: ♀, lectotype of *C. graciosus* Tschek (NMW); ♂, paralectotype of *C. graciosus*, coll. Tschk (NMW). Poland: ♀, lectotype of *C. pungens* Grav., Wrocław, leg. Gravenhorst (ZI). No data: ♀, *C. apparitorius* (de Villers), 1st specimen in Gravenhorst's collection (the neotype of *Cryptus apparitorius*) (ZI); ♀, label illegible, leg. Brade, coll. Dittrich (ZI).

### *Cryptus leucocheir* (Ratzeburg, 1844)

*Ichneumon leucocheir* Ratzeburg, 1844, *Ichneumoniden der Forstinsekten* 1: 133, ♂ (nomen dubium; type lost).

*Cryptus leucocheir*: Ratzeburg, 1853, *Ichneumoniden der Forstinsekten* 3: 135, ♂.

Dr. J. Oehlke kindly informed me that there is no type material of *C. leucocheir* to be found in the remains of Ratzeburg's collection at Eberswalde. However Oehlke did find a specimen amongst these which is undoubtedly a male of *C. leucocheir*, but there is no indication that this is the holotype. Ratzeburg mentioned a person "Zebe" in his original description, stating that Zebe bred the specimen from "*Cimbex*" *amerinae*. Neither Oehlke nor E. Königsmann (Berlin) were able to trace the name "Zebe", so it is not known whether Ratzeburg returned the type to its original owner.

The *C. leucocheir* female is rather characteristic, but the males are much more difficult to identify. I propose to designate the following specimen from the Ratzeburg collection at Eberswalde as the neotype.

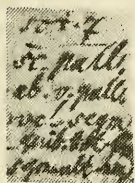


Fig. 58. Label on the neotype (DEI) of *C. leucocheir* (Ratzeb.)



Characteristics of the neotype of *Cryptus leucocheir*. Male, 14.2 mm. Front wing 9.1 mm. Labels: a green tag with incomprehensible text (Fig. 58). Neotype designated and labelled accordingly.

Head black, mandibels, clypeus, inner and outer orbits ivory. Antennal scrobes polished, with transverse wrinkles. Frons rugose. OOL : diameter posterior ocellus, about 1 : 1. Temple and gena broad, polished, with fine setiferous punctures. There is no indication of a dorsal tentorial pit.

Thorax black, ivory marking on anterior margin of pronotum, tegulae, scutellum 2 and subalar prominence. Areola large, square. Axillary vein in hind wing parallel to hind margin. Both propodeal carinae complete. Coxae ferruginous. Legs predominantly yellowish to orange-brown. Tarsal segments 2, 3 and 4 of hind leg white.

Petiole of gaster fuscous. Postpetiole and following tergites orange. Some fuscous discoloration on tergites 4, 5 and 6. Tergites subpolished with very fine setiferous punctures and vague microsculpture.

Description of the male. Based on two wrongly identified specimens in Tschek's collection. Labels: both with "20.6.(18)70" in Tschek's writing. A printed label: Tschek 1872 Piesting. Both with a white tag with pencil writing: "*recreator* F." (not in Tschek's writing). The identification is obviously wrong as neither specimen has the dorsal tentorial pit characteristic of the genus *Meringopus*.

Head black. Maxillary palpi long, last segment only slightly shorter than the fourth antennal segment. Labrum ivory. Mandibles ferruginous, with black apices and ivory spot on dorsal rim. Clypeus well-defined, with reddish yellow spot. Central convexity of face present. Face with adpressed grey hairs. Antennae long and slender, about 0.66 length of body. Tyloidea on segments 17—22 (18—24). Lower 0.3 of frons polished, with indication of transverse wrinkles. Medial upper region of frons rugose, semicircular in appearance with the median ocellus in the centre. Inner orbits and OOL region alutaceous. OOL : POL, about 1 : 1. Inner and outer orbits with ivory markings. Temple and gena polished, with fine setiferous punctures.

Thorax black, ivory spots on anterior margin of pronotum, subalar prominence, tegulae, scutellum 2. Epomia weak. Mesoscutum polished, regularly and finely punctured, with adpressed, short bristles. Prescutal suture well-developed, reaching line of front wings. Propodeum with both carinae. Index of propodeal spiracles 3.2 (3.0). Legs with all coxae and trochanters ferruginous. Other parts of legs orange, except fuscous apex of hind tibia and basitarsus. Tarsal segments 2, 3 and 4 of hind leg white. Index of front tibia 4.4 (4.7). Wings subhyaline.

Gaster orange, except the petiole. Tergites rather conspicuously shiny (which agrees with Ratzeburg's "mit glatten, stark glänzenden Ringen"), with fine setiferous punctures and very fine alutaceous microsculpture.

Female. — Tschek (1870a: 120) founded the female of this species on material in the Vienna Museum. He writes to have seen a female bred from "*Cimbex*" *amerinae*, on which he based the sexual relation between the earlier described male and the female.

Description of the female of *C. leucocheir*. Body length, 14.4—15.1. Front wing 10.8—11.7. Head black. Palpi and labrum brown. Clypeus well-developed, strongly convex, anterior margin straight. Anterior tentorial pits well shown in lateral corners of clypeus. Dorsal rim and medial part of mandible red, apices black. Face with close adpressed short grey pilosity. Facial convexity moderate, including most of the supraclypeal area. Antennae brown to rufous in strong light. Index of postanellus 5.0. Antennal segments 8—11 white

dorsally. Frons deeply concave. Lower 0.5 of frons polished, with transverse ridges. Upper 0.5 of frons somewhat rugose medially, orbital parts alutaceous. OOL : POL, 10 : 13. Temple and gena polished, with adpressed grey pilosity. Gena exceptionally broad. Breadth gena (at base of eye): compound eye, 6 : 7. Inner and outer orbits marked with yellow. Genal carina meeting the hypostomal carina distinctly away from the mandibular base. Breadth mandible : distance between mandibular base and meeting point, 4 : 3 (varying towards 1 : 1).

Thorax black. Notum 1 with some longitudinal wrinkles. The sculpture of the thorax is on the whole rather fine, only the propodeum is more rugose. Mesoscutum finely and regularly punctured, with short adpressed bristles. Prescutal sutures well-defined, reaching the line of front wings. Speculum large and highly polished. Both propodeal carinae present, the posterior carina bluntly dentate sublaterally. Propodeal spiracle large, index 3.0. Wings somewhat infusate. Areola with weakly converging sides, anterior side long (Fig. 12). Ramellus present. Nervulus (cua) antefurcal. Legs with coxae and trochanters ferruginous. Other parts of legs orange. Index of front femur 3.8—4.0. Index of hind femur 4.4—4.9.

Gaster bright orange, except fuscous petiole and part of postpetiole. All tergites very finely alutaceous. Ovipositor 6.5 mm; tip of ovipositor Fig. 46.

Biology. — *Cryptus leucocheir* is undoubtedly a parasite of *Clavellaria amerinae* (Linné, 1758) (Tenthredinoidea). Both Ratzeburg (1844 : 133) and Tschek (1870a: 120) clearly state this sawfly to be the host. I have studied a fine specimen (Pl. 1 Fig. 9) with the cocoon of *Clavellaria amerinae* on the pin, the cocoon having a very characteristic structure. The cocoon of the parasite is shown in Pl. 1 Fig. 5. Regarding the distribution of the host, Enslin (1917: 580) indicates Central and Northern Europe, Spain and Asia Minor. Lorenz and Kraus (1957 : 261) studied the larva of the sawfly. *C. leucocheir* also occurs in the Netherlands. Two Dutch specimens were taken long ago by the able Dutch collector Koornneef (1908 and 1909). There are no recent indications of its occurrence, though *Populus*, the host plant of *Clavellaria*, is very common in the Netherlands.

Material examined. — Austria: 2 ♂, Piesting, 20.VI.1870, leg. Tschek (NMW). Germany: the neotype, label illegible (DEI); ♀, Rosstrappe Treseburg, 21.VII.1889, coll. Konow (DEI). Netherlands: ♀, Spijkenisse, 12.VIII.1909, leg. Koornneef (ELW); ♀, Vlaardingen, 27.VII.1908, leg. Koornneef (ELW); ♂, Rockanje, 4.VII.1914, leg. A. Dulfer (coll. Oudemans) (MA); ♂, no locality and date, leg. B. Boon, ex *Clavellaria amerinae* (coll. Oudemans) (MA). Poland: ♀, Breslau, 1866 (coll. Dittrich) (ZI); ♀, label illegible, VII.1879 (?) (coll. Dittrich) under *C. obscurus*! (ZI).

### *Cryptus genalis* Tschek, 1872

*Cryptus genalis* Tschek, 1872, Verh. zool.-bot. Ges. Wien 22: 240, ♀.

The holotype of *C. genalis* is a most remarkable specimen of *Cryptus*. I have not been able to find similar examples; nevertheless I infer from Meyer's key (1934) that such specimens do occur and for that reason I prefer to retain this species until further material is available. *C. genalis* belongs to the *inculcator* group.

Characteristics of the holotype. Female, 9.2 mm. Front wing 7.5 mm. Labels: a white tag with red ink "Type" (Tschek's writing), another white tag with an illegible hiero-

glyph (m ?), a white label with Tschek's writing "*Cr. genalis* Tsch." Holotype labelled accordingly.

Head ferruginous (in bright light); malar space, inner and outer orbits marked with yellow. Face roughly punctured, with adpressed hairs. Clypeus and facial convexity pronounced. Frons rather concave. Antennal scrobes polished, with transverse wrinkling. Upper frons medially rugose, OOL-region alutaceous. OOL : diameter posterior ocellus, 10 : 7. Antennae strongly differing from the ordinary *Cryptus*-type: short and stout. Index postanellus, 2.7. All following segments short. Segments 9—11 white dorsally. Temple polished, with scattered punctures, gena exceptionally broad, towards genal carina with some wrinkles. Breadth gena: breadth compound eye, 1 : 1. Genal and hypostomal carinae raised into lamellae, meeting about half the width of mandible beyond the lower mandibular condyle (there is *no* gap between the lamellae, as in *C. incisus*!).

Thorax black; anterior margin of notum 1, scutellum 2 and subalar prominence marked with yellow. Epomia present. Episternum 2 polished, rather irregularly punctured, more densely so ventrally, the upper part wider. Pleural parts of propodeum roughly sculptured; this is more or less atrophied dorsally towards posterior carina, hence a polished area appears. Both carinae indicated, but obliterated medially. Index of propodeal spiracle, 3.6, long elliptic in shape. Wings subhyaline. Areola with broad anterior side, sides weakly converging. All coxae and trochanters ferruginous, all femora orange, exceptionally short and stout, indices: 3.1 (1), 3.0 (2), 3.1 (3). Front and middle tibiae and tarsi yellow brown. Front tibia short, rather inflated. Front tarsus short. Front tibia: front tarsus, almost 1 : 1. Hind tibia brownish.

Gaster, except base of petiole, orange. Tergites very finely alutaceous, almost sub-polished. Ovipositor, 2.8 mm, its tip flat.

Material examined. — Austria (?): ♀, the holotype, no locality, no date, leg. Tschek (NMW).

### *Cryptus subspinosus* Smits van Burgst, 1913

*Cryptus subspinosus* Smits van Burgst, 1913, Ent. Ber. 3: 332—333, ♂.

Five males of this species were swept from low plants in the vicinity of Tunis by Smits van Burgst. The female remained unknown. Three original males, all syntypes, are still in Smits van Burgst's collection at Wageningen. I suggest that the two other syntypes were given to Schmiedeknecht who was on friendly terms with the author. In the following discussion of this species a description of the unknown female is included.

Characteristics of the lectotype of *Cryptus subspinosus* Smits van Burgst. Male, 9.4 mm. Front wing 7.0 mm. Labels: a yellowish label with red rim and printing "Smits v. Burgst omgev. Tunis 191"; a green tag "cotype *C. subspinosus* S.v.B.". Lectotype hereby designated and labelled accordingly.

Head black, inner and outer orbits with slight yellow marking. Clypeus convex, with broad, polished anterior margin, upper part with setiferous punctures. Facial convexity weak. Mandibles, clypeus and face with conspicuous, silvery, adpressed to erect pilosity. Malar space coriaceous, about equal to width of mandibular base. Antennae with tyloidea on segments 19—22. Lower half of frons (the antennal scrobes) concave, polished. Upper frons rugose. OOL : diameter of lateral ocellus, 8 : 6. Vertex, temple and gena with silvery hairs, about as long as 0.5 the width of OOL. Punctures on temple and gena strong, separated by their diameter. Lower gena rather broad, slightly shorter than the width of the compound eye.



Thorax black, scutellum 2 with yellow spot. Epomia weak. Mesoscutum and scutellum polished. Parapsides with irregular rough punctures; scutellum 2 more finely punctured. Other parts of thorax with rough sculpture; episternum 2 in part polished with large punctures. Propodeum roughly rugose; the anterior carina weak, the posterior carina present, with the sublateral corners rather heavily developed into almost horn-like structures. An area superomedia is indicated. Wings subhyaline. Areola with cubital cross veins strongly converging. The axillary vein in the hind wing almost parallel to inner hind margin of wing. Indices of femora: 4.3 (1); 5.3 (2); 5.1 (3) (all stout; compare the female). Front femur dirty brown, middle femur dark brown, hind femur black, with very fine setiferous punctures. Front and middle tibiae dirty brown, hind tibia and basitarsus almost black, 2nd tarsal segment with white apex, 3 and 4 white.

Gaster with first segment black, apical margin reddish, following segments somewhat dirty reddish, claspers fuscous.

In Habermehl's collection in the Senckenberg Museum at Frankfurt (Main) I found two females under *C. spinosus* Grav. and *C. bucculentus* Tschek, respectively, both obviously wrongly identified. The first specimen, collected and identified by Schmiedeknecht bears his label: "*Cryptus spinosus* Grav. var. *antennis* haut albo-annulatus", thus indicating its distinction from ordinary examples. Both specimens in question represent the undescribed female of *C. subspinosus*. A description of the female is given below.

Female<sup>1)</sup>. — Head black, inner and outer orbits with vague yellow lining. Clypeus rather convex, a broad anterior margin polished, with some scattered punctures, upper part more closely punctured. Facial convexity well shown. Face closely punctured with adpressed grey pilosity. Malar space: width of mandibular base, 5 : 4. Malar space broad, alutaceous. Antennae rather stout, without a white band. Index of postantennellus, 5.0—5.6. Lower half of frons (the antennal scrobes) rather deeply concave, polished, in one specimen with vague radiating ridges. Upper half of frons declivous but not conspicuously concave; rugose. OOL : diameter lateral ocellus, 8 : 7 (specimen from Sicily); 6 : 8 (specimen from Algeria). Ocelli comparatively large. Vertex, temple and gena with suberect, short, grey hairs. Lower gena punctured to vaguely punctured, broad, reaching the width of compound eye.

Thorax black, scutellum 2 and notum 3 in one specimen with traces of ferruginous colour. Epomia weak. Mesoscutum polished, with large shallow punctures. Prescutal sutures strong. Scutellum 2 polished, finely punctured to almost without punctures. Notum 1 and episternum 2 with variable sculpture, in some parts polished with strong punctures, in other parts rugose. Speculum polished. Propodeum rugose, with anterior transverse carina completely obliterated, sublaterally a slight knob. Posterior carina strong, sublaterally with heavy, acute dentation (Fig. 19); the transverse dorsal part straight. Propodeal spiracle relatively small, elliptic. Wings weakly infusate. Areola with cubital cross veins rather strongly converging, hence anterior side narrow. Axillary vein in hind wing converging towards hind margin of wing. Front and middle coxae somewhat ferruginous, ventrally highly polished with fine, widely placed setiferous punctures. Hind coxae black, dorsally closely and roughly punctured, ventrally polished, with rough punctures. Front femur light brownish, index 4.0; middle femur brownish, index 4.3—4.4; hind femur dark brown to black, index 4.8—5.1, with close setiferous punctures. Front tibia slightly inflated; front and middle tibiae dirty yellowish brown, hind tibia dark brown.

<sup>1)</sup> Front wing 7.5—8.0 mm.

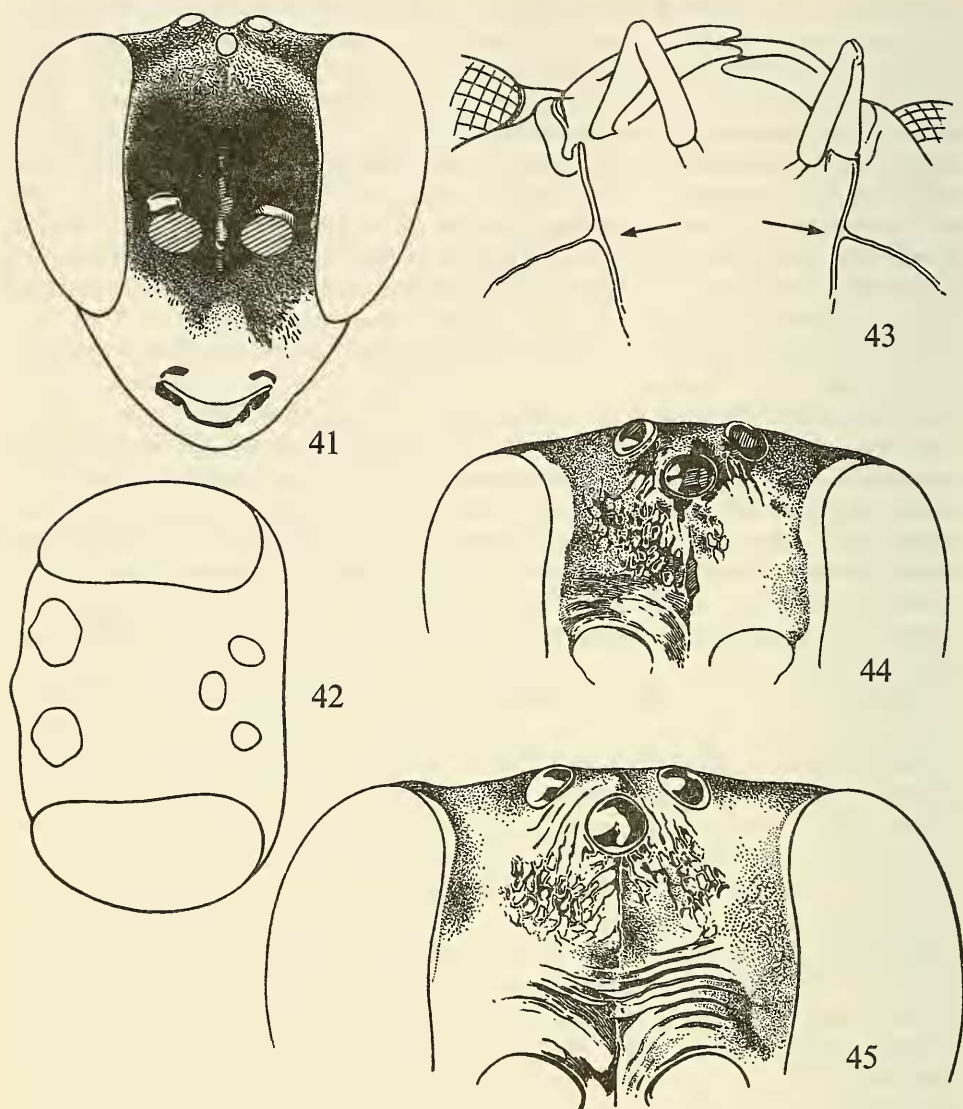


Fig. 41—45. Various details of *Cryptus* heads: 41, *C. titubator* (Thunb.) ♀, syntype of *C. difficilis* Tschek, Piesting, 7.V.1867, coll. Tschek (NMW), frontal aspect; 42, the same specimen as in Fig. 41, dorsal aspect; 43, *C. italicus* Grav., ♀, Bolzano, VI.1913, leg. Smits van Burgst (ELW), position of hypostomal and genal carina in ventral view of head; 44, *C. diana* Grav., ♂, S. Pietro, Funes, Italy, 20.VII—9.VIII.1968, leg. van Rossem (PD), frontal aspect; 45, *C. diana* Grav., ♀, label illegible, 22.VI.1907, coll. Dittrich (ZI), frontal aspect

Petiole of gaster fuscous, postpetiole fuscous-orange, all following tergites orange to somewhat dirty orange towards apex of gaster. Sculpture of tergite 2, 3 and 4 very closely and finely alutaceous, following tergites more polished with microsculpture. Ovipositor very long, somewhat curved, 0.50—0.60 length of front wing; tip of the *Meringopus vitillator* type.

Material examined. — Algeria: ♀, St. Cloud Oran, Dr. J. Bequaert leg., 3.VI.1910, coll. Habermehl (SM). Italy: ♀, Syracuse, 1907, leg. Schmiedeknecht, coll. Habermehl ex coll. Weis (SM). Tunis: 3 ♂, 191, leg. Smits van Burgst (ELW) (lectotype and two paralectotypes).

Remark. — A female from Yugoslavia, lake Ohrid, could not be placed properly. The specimen shows a rather striking resemblance with *C. subspinosus*, but it has a short ovipositor.

I have abandoned the idea of describing this single specimen, either as a new species or even as a form of *C. subspinosus* as long as more material is wanting. Nevertheless a specimen such as this one, causes confusion in the key, since it could easily be mistaken for *C. spinosus*. It differs at first sight from the latter species by the deeply concave frons. A short description follows here:

Female, 12.0 mm. Front wing 7.7 mm. Head black, inner and outer orbits with yellow marking. Pilosity of head badly damaged by dirt. Index of postanellus, 5.4. Antennae without a white band. Frons deeply concave, the antennal scrobes highly polished, upper frons somewhat rugose. OOL : diameter lateral ocellus, 9 : 7.

Thorax black. Epomia well-developed. Propodeum with both transverse carinae indicated. The sublateral corners of the posterior carina more robust than in *C. subspinosus* and showing more agreement with *C. spinosus*, thus taking an intermediate position. All femora of rather heavy appearance. Index of hind femur, 4.8. Colour of legs as in *C. subspinosus*.

Gaster with base of petiole black, remaining parts dirty red. Ovipositor 0.38 length of front wing.

Material examined. — ♀, Yugoslavia, lake Ohrid, shore near Ohrid (Macedonia), 20.VI.1965, on *Anchusa officinalis*, leg. C. van Heijningen (RMNH).

### *Cryptus medius* Szépligeti, 1916

*Cryptus medius* Szépligeti, 1916, Ann. Mus. Nat. Hung. 14: 246, ♀.

The holotype of *C. medius* represents a genuine species of *Cryptus*, related to *C. subspinosus* Smits van Burgst. *C. medius* inhabits the Alai Range and does not seem to occur in the Western Palearctic area. I have only seen the holotype and the following description of the species is based on it.

Characteristics of the holotype of *Cryptus medius* Szépligeti. Female, 9.5 mm. Front wing 7.6 mm. Labels: a white tag "Alai mont. 1905 Korb"; a red tag; a white label with Szépligeti's writing "*Cryptus* (49) *medius* n.sp.". Holotype labelled accordingly.

Head black with the following yellowish markings: spot on mandibular base, clypeus, inner and outer orbits. Clypeal and facial convexities indicated. Malar space: width mandibular base, 3 : 2. Malar space broad. Face and clypeus with rather sparse and short hairs (hairs may have been rubbed off!). Face subpolished, somewhat alutaceous, rather indistinctly punctured. Scapi pear-shaped, large. Index of postanellus, 5.8. Frons deeply concave, alutaceous to somewhat wrinkled. OOL : diameter of lateral ocellus, 9 : 5 (OOL definitely wider, compare *C. subspinosus*). Lower gena exceptionally broad, width gena



(at base of eye): width of compound eye, 5 : 4. Lower gena highly polished with some vague and widely scattered punctures.

Thorax black. Epomia present. Mesoscutum and scutellum 2 polished. Lateral parts of mesoscutum (parapsides) and scutellum 2 rather sparsely and finely punctured. Other parts of thorax densely and roughly sculptured. Wings infusate. Areola with anterior side broad, about half the width of third cubital cross vein; sides not strongly converging. Axillary vein in hind wing parallel to inner margin of wing. Legs with coxae and trochanters fuscous-ferruginous; remaining parts bright orange to slightly brownish on hind tarsus. Indices of femora: 4.1 (1), 4.2 (2), 5.1 (3); all stout. Propodeum with anterior transverse carina only medially developed; posterior carina complete, sublaterally somewhat raised to blunt teeth. Propodeal spiracle relatively small, short elliptic.

First gastral segment fuscous. Tergites 2 and 3 orange, following tergites fuscous, all with fine, alutaceous sculpture. Apex of gaster somewhat compressed. Ovipositor very long, 5.7 mm, slightly curved, 0.75 length of front wing; tip gradually tapering, nodus weak.

Male. — Unknown.

Material examined. — U.S.S.R.: ♀, Alai mont., leg. Korb, 1905 (coll. Szépligeti) (TM) (holotype of *C. medius*).

### *Cryptus bucculentus* Tschek, 1870

*Cryptus bucculentus* Tschek, 1870b, Verh. zool.-bot. Ges. Wien 20: 406 (holotype lost) ♀.

*Cryptus bucculentus*: Tschek, 1872, Verh. zool.-bot. Ges. Wien 22: 241, ♂ ♀.

*Cryptus bicolor* auctorum.

*Cryptus bicolor* Lucas, 1849, Exploration scientifique de l'Algérie (Zoologie) 3: 330, ♂ ♀ (not 391) partim.

? *Cryptus armatus* Lucas, 1849, Exploration scientifique de l'Algérie (Zoologie) 3: 330—331, ♂ ♀ (no 392) (species inquirenda) (types not seen).

*Cryptus saidensis* Schmiedeknecht, 1900, Termész. Füzetek 23: 243, ♂ ♀.

The type material of *Cryptus bicolor* Lucas, received from the Muséum National d'Histoire Naturelle (Paris) through the kindness of Mademoiselle Kelner-Pillault, is a mixture of three species. The specimen from which the author undoubtedly described his species is a female of *Trychosia legator* (Thunberg, 1822). The description of the female closely agrees with the latter specimen and this must be the lectotype. A male with an original label of the author does not agree with the description (though I suspect that "le quatrième segment entièrement noir" is a mistake) but this specimen is not a Cryptine (it belongs to the Ichneumoninae). Finally, the third specimen is *Cryptus bicolor* of authors, but it was marked "var" by the author and described as such (Lucas 1849: 330, variété A) and consequently it does not meet the requirements of Article 72b ("except any that he refers to as variants"). Thus *Cryptus bicolor* Lucas has to be placed in the synonymy of *Trychosia legator* (Thunberg, 1822).

The next available name would be *Cryptus armatus* Lucas, 1849, earlier placed in the synonymy of *C. bicolor* by Schmiedeknecht (1931). It is not clear on what evidence this was based, perhaps the author's own comment "Ce *Cryptus* ressemble beaucoup au *C. bicolor*". Considering the rather unexpected results of the type investigation on *C. bicolor* it seems better to list *C. armatus* Lucas as a species inquirenda, since the type material sent by Mademoiselle Kelner-Pillault had no bearing upon the latter.

In 1870 (b) Tschek described *C. bucculentus* on one female in the Vienna Museum,

apparently without data. The holotype is now missing, but of *C. bucculentus* there are specimens in Tschek's collection: one female from Dalmatia, leg. Erber, mentioned by Tschek (1872: 241) and two males, one with a typical "Type" label of Tschek. Though neither of these specimens can be the holotype, the identity of this original Tschek material is sufficiently reliable to recognize his material as belonging to *C. bicolor* auctorum. I propose to select Tschek's female from Dalmatia as the neotype.

Characteristics of the neotype of *Cryptus bucculentus* Tschek. Female, 11.3 mm. Front wing 7.8 mm. Labels: a small discoloured tag; a label with "Erber Dalm." (violet ink); a label "Type" (red ink, Tschek's writing) and a label "bucculentus Tschek ♀" det. Habermehl. OOL about  $2 \times$  width of lateral ocellus. Index of postanellus, 4.2. Ovipositor 0.38 length of front wing.

Description of the female. — Body length 9.3—12.7 mm. Front wing 7.0—8.0 mm.

Head black. Palpi and labrum light brown. Mandibels black to fulvous. Clypeus polished with scattered punctures and some erect hairs, moderately convex, anterior margin medially slightly protruding, laterally incurved towards the upper articulation of the mandible. Facial convexity moderate, face entirely coriaceous, with adpressed grey pilosity. Lower inner orbits may show ivory to yellow marking. Antennae relatively short and thick, dark brown to reddish. Index of postanellus 4.1—4.7. Frons rather concave, antennal scrobes polished with transverse ridges. Medial and ocellar region finely rugose. Lateral parts of frons, OOL-region and vertex alutaceous with fine punctures. Head broad. OOL about  $2 \times$  diameter lateral ocellus. Temple and gena with moderately fine punctures which vary somewhat in density in different specimens, more dense towards the mandibular base. Between the punctures very fine microsculpture. The gena broad and buccate towards the mandibular base. Breadth gena (at base of eye): maximum breadth of eye, 1 : 1 (or gena somewhat broader).

Thorax entirely black (also in North African specimens). Epomia present, but very weak. Mesoscutum and scutellum 2 polished, with dense, fine punctures, in the lateral parts of the mesoscutum separated by about 1.0—0.5 their diameter, or less. Episternum 2 in the pleural region roughly sculptured, except for a small portion lying just dorsally of the sternaulus which has the sculpture of the ventral region. The ventral region of the episternum 2 is polished and regularly and finely punctured. Speculum polished. Propodeum roughly rugose, anterior transverse carina in most specimens obliterated; posterior carina well developed, bounding the horizontal part of propodeum, which is comparatively long, beyond the posterior carina the propodeum almost vertically dropping. Propodeal spiracle slightly pear-shaped, index about 2.0. Wings somewhat infusate. Nervulus (cua) antefurcal; areola (Fig. 17) rather large, anterior side about 0.2 of the breadth of the radial cell (3R1) (measured across the areola). Legs with all coxae ferruginous to dark ferruginous. All femora relatively short and stout. Index front femur, 3.7—3.9. Index of hind femur, 4.4—4.8. In the Southern European form the hind femur is fuscous-ferruginous to brown in colour, also the middle and front femora fuscous. In North African material all femora brightly orange. Hind tibiae and tarsi in both forms about the same in colour, viz, fuscous-ferruginous.

Gaster with petiole fuscous-red to black. Postpetiole entirely black to for the greater part orange. Segments 2, 3 and 4 from bright orange to fuscous red. Apex ferruginous to black. The tergites including the greater part of the 1st have a dense alutaceous sculpture. The postpetiole, the second and third tergite show some widely scattered, fine punctures between the alutaceousness. These punctures are somewhat more dense along

the lateral margin of tergite 2. Beyond the third tergite the typical sculpture blurs. Ovipositor 0.38—0.41 length of front wing, rather stout. The tip shows a clear nodus and rather conspicuous dentation (Fig. 48).

Male. — The male of this species is rather easily recognized, it shows several characters also found in the female.

Head black, conspicuous ivory marking of the following parts: greater part of the mandibles, inner orbits broad, the facial convexity, which spot is confluent with the clypeal spot in several specimens. Palpi light brown to brown. Clypeus, lower face and frons agree with the characters given for the female. Gena broad, polished and regularly punctured. From the punctures short, erect to adpressed hairs arise. Tyloidea on antennal segments 12—22, 12—20, 13—22. OOL about  $2 \times$  the diameter of lateral ocellus.

Thorax black, agreeing with the female, somewhat less heavily sculptured. Colour of the legs agreeing with the female. Femora more slender. Tarsal segments, 2, 3 and 4 of hind leg white to whitish.

Gaster with first segment and apex in most specimens fuscous. In European specimens the tergites 2, 3 and 4 may show a tendency to a more fuscous red.

The type material of *C. saidensis* Schmiedeknecht is preserved in the Berlin Zoological Museum. Four specimens were kindly sent to me by Dr. E. Königsmann, apparently all syntypes. Schmiedeknecht himself synonymized his species with *C. bicolor*.

Characteristics of the lectotype of *C. saidensis*. Female, 12.1 mm. Front wing 8.5 mm. Labels: a white tag printed "coll. Schmiedeknecht", a white label with Schmiedeknecht's writing "*Cryptus saidensis* n.sp.", an orange label printed "Typus". Lectotype hereby designated and labelled accordingly. Head: OOL  $2 \times$  diameter of lateral ocellus. Post-anellus, index 4.2. Thorax: index hind femur, 4.4. All femora bright orange. Gaster with ovipositor 0.41 length of front wing.

*Cryptus bucculentus* is a typical species of Southern Europe and North Africa. Ceballos (1931: 82) gives a list of Spanish localities and mentions it as "uno de los criptinos más abundantes en España". The same holds good for North Africa: I have studied a fine series in the Smits van Burgst collection (ELW), collected in the surroundings of Tunis. These specimens agree with European material, but differ in the bright orange colour of the femora, this led to the description of more than one species. I do not think there is much point in naming the two colour varieties, since intermediate forms also occur.

Material examined. — Algeria: ♀, leg. Lucas, labelled *C. bicolor* var. (Muséum Paris, no 78—49); ♀, Saida (Oran)<sup>1)</sup>, V.1895, coll. Schmiedeknecht (lectotype of *C. saidensis*) (ZM). Austria: 2 ♂, Piesting (?), leg. Tschek (NMW). Italy: ♂, Bolzano, VI.1913, leg. Smits van Burgst (ELW). Jugoslavia: ♀, Dalmatia, leg. Erber, coll. Tschek (neotype of *C. bucculentus*) (NMW). Spain: ♀, Malaga, 5 km east of Alhaurin el Grande, 19.V.1967, leg. M. J. and J. P. Duffels (MA); ♀, Malaga, San Julian, 13.V.1967, leg. M. J. and J. P. Duffels (MA). Tunisia: 16 ♂ and 14 ♀, Tunis, IV.1911, leg. et coll. Smits van Burgst (ELW); ♂, Tunis, leg. Schmiedeknecht (paralectotype of *C. saidensis*) (ZM); ♂ ♀, Tunis, Bardo, 1897, leg. Schmiedeknecht (paralectotypes of *C. saidensis*) (ZM).

<sup>1)</sup> The specimen bears no label, but is probably from the type locality.



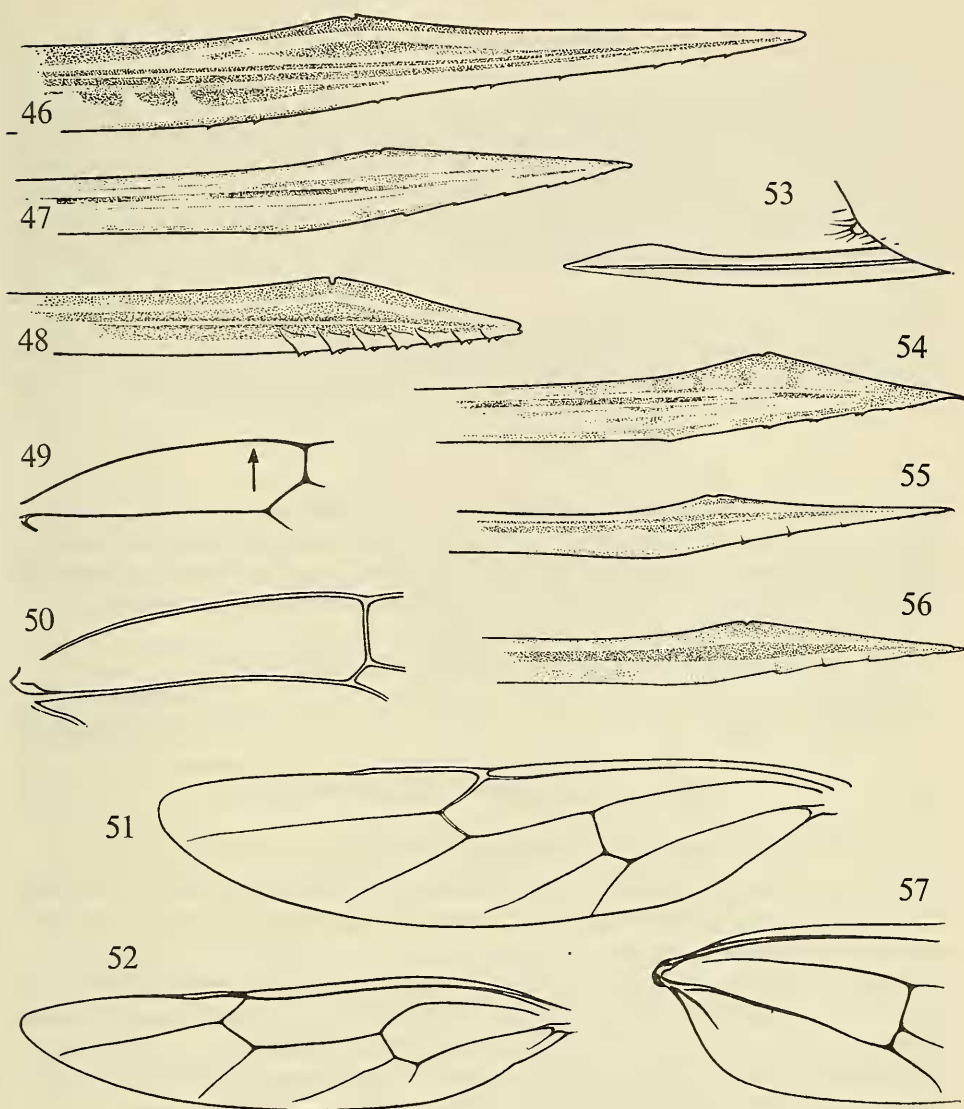


Fig. 46—48. Ovipositor tips of *Cryptus*: 46, *C. leucocheir* (Ratzeb.), ♀, Spijkenisse, 12.VIII.1909, coll. Koornneef (ELW); 47, *C. armator* F., ♀, Piesting, 30.VIII.1866, coll. Tschek (NMW); 48, *C. bucculentus* Tschek, ♀, Tunis, IV.1911, coll. Smits van Burgst (ELW). Fig. 49—52, details of wings: 49, *Aritranis femoralis* (Grav.), ♂, Toledo, Spain, 25—27.VIII.1967, leg. P. M. F. Verhoeff (PD), right hind wing, medial vein (arrow); 50, *C. luctuosus subquadratus* Thomson, ♂, Putten, 21.IV.1915, leg. J. Th. Oudemans (MA), straight medial vein in right hind wing; 51, *Caenocryptus rufiventris* (Grav.), ♀, ex coll. Konow, 25.VIII.1888 (ex Museum Berlin), coll. H. Townes, homotype, left hind wing with straight medial vein; 52, *Ischnus alternator* (Grav.), ♀, Ede (Netherl.), 30.VIII.1963, leg. van Rossem (PD), strongly arched medial vein. Fig. 53, *Hidrysa frater* (Cresson), ♀, holotype of *Cryptus sordidus* Tschek, coll. Tschek (NMW), ovipositor. Fig. 54—56, ovipositor tips of *Cryptus*: 54, *C. luctuosus subquadratus* Thoms., ♀, Putten, 17.VI.1919, coll. Oudemans (MA); 55, *C. immitis* Tschek, ♀, Spain, la Aliseda, 23.VI.1961 (RMNH); 56, *C. spinosus* Grav., ♀, Greece, Gardiki Om, 1—4.VIII.1963 (RMNH). Fig. 57, *C. attentorius* (Panzer), ♀, Piesting, 10.VI.1870, coll. Tschek (NMW), right hind wing with axillary vein diverging from inner hind margin of wing

THE *Cryptus lugubris* GROUP

Three closely related species viz., *C. lugubris* Grav., *C. fibulatus* Grav. and *C. luctuosus subquadratus* Thomson, the latter undoubtedly a parasite of *Trichiosoma lucorum* (Linné, 1758) (Cimbicidae), represent a characteristic group of species in the Palearctic region. In particular *C. luctuosus subquadratus* and *C. fibulatus* take a rather remote position in the genus *Cryptus* and would probably allow for a subgenus, but for the present my knowledge of the related species in the adjacent faunal regions is too limited to arrive at a conclusion.

Although in some respects *C. lugubris* and *C. luctuosus subquadratus* seem to be closely related and suggest to be mere "biological" forms of one species, they show some reliable characters in both sexes, which make the retention of two species more natural.

*Cryptus lugubris* Gravenhorst, 1829

This species is probably more common than the available material would suggest; judging from collecting data it could well be a mountain species. Two subspecies are known in the Palearctic region, of the one from Japan only the male was described. Nothing is known about the biology, but I surmise that a Cimbicid is the host.

Key to the males of the subspecies of *Cryptus lugubris*

1. Hind femur black . . . . . *atrifemur* Townes
- Hind femur orange . . . . . *lugubris* Gravenhorst

*Cryptus lugubris lugubris* Gravenhorst, 1829

*Cryptus lugubris* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 456, ♀ (no 24).

Gravenhorst based this species on one female from Genoa (Italy). There is no doubt that the female, now in the collection at Wrocław, is the holotype. The present author has remounted the specimen. The original Spinola pin is kept with the holotype.

Characteristics of the holotype of *Cryptus lugubris*. Female, 10.0 mm. Front wing 7.8 mm. Labels: none. Holotype labelled accordingly. Index of postanellus 4.8. Antennal segments 7—11 white dorsally. Front coxae damaged by dermestids. Index of front femur 4.1. Hind tarsi missing (as stated by Gravenhorst). Gaster ferruginous. Tergites 2 and 3 damaged by dermestids. Ovipositor short, 2.2 mm, 0.28 length of front wing.

Description of the female. — Body length, 10.0—13.0 mm. Front wing 7.8—9.2 mm. Head black, inner and outer orbits with slight yellow markings. Palpi brown. Clypeus convex, with broad shiny anterior margin, lateral corners somewhat lamelliform. Upper part of clypeus coarsely punctured. Facial convexity weak. Face closely punctured with adpressed grey hairs. Face much wider than long; width between the compound eyes: length between epistomal suture and base of antenna, 2 : 1. Lower frons concave, antennal scrobes polished. Gena polished, with widely placed setiferous punctures. Temple with scattered punctures and some vague microsculpture. Antennae stout, rufous. Index of postanellus, 4.6—4.8. Antennal segments 7—11 white dorsally. Upper frons rugose. OOL : diameter of lateral ocellus, 10 : 8; 8 : 6.

Thorax black, anterior margin of notum 1 marked ivory. Notum 1 rather strongly wrinkled, epomia weak. Mesoscutum polished, with fine, dense punctures and adpressed,

short, grey setae. Prescutal sutures strong. Scutellum 2 slightly convex, with fine punctures, more widely placed than on mesoscutum (the fine punctures on scutellum 2 form a very conspicuous character). Episternum 2 rugose. Posterior part of sternaulus with some heavy wrinkles. Propodeum roughly sculptured, both transverse carinae medially obliterated. Posterior carina sublaterally developed into a blunt dentation. Propodeal spiracle small, but definitely elliptic, index about 2.0. Legs with coxae rufous to black, all femora and tibiae yellow-orange. Front and middle tarsi yellow-orange. Index of front femur 4.0—4.4; hind femur 5.0. Wings hyaline; anterior side of areola about 0.25 of width radial cell (measured across the areola).

Gaster fuscous-ferruginous. Apical margins of tergites in fuscous specimens rather conspicuously reddish. Tergites regularly and finely alutaceous, covered with very short adpressed setae. Ovipositor short, 2.2—2.8 mm, stout, 0.28—0.30 length of front wing. Tip of ovipositor differing from the ordinary type in *Cryptus*, nodus rather deep and dorsal rim sharp.

Description of the male. — Body length, 12.5—12.9 mm. Front wing 9.0 mm. Head black; the following parts may show ivory marking: maxillary palpi, mandibles, labrum, clypeus, face (black bands running from antennal sockets to epistomal region), scapi, frontal and outer orbits. Clypeus with broad shiny anterior margin, lateral corners somewhat lamelliform. Facial convexity weak. Lower 0.3 of frons polished (the antennal scrobes); upper 0.70 of frons conspicuously alutaceous; the boundary between the alutaceous and polished region strikingly sharp and straight. The entire frons moderately concave. Ocelli comparatively large, light brown in colour; the entire ocellar region strongly rising above the level of the vertex. Diameter lateral ocellus : OOL, 7/8 : 10. OOL wide. Antennae long,  $2.0 \times$  head + thorax, with tyloidea on segments 19—24/25. Compound eyes in relation to the head large and convex. Temple and gena polished, with widely placed, fine, setiferous punctures. The entire head with short silvery hairs.

Thorax black; the following parts may show ivory marking: anterior margin of notum 1, tegulae, subalar prominence, scutellum 2, ventral margin of notum 1. Epomia weak. Mesoscutum polished, finely punctured. Scutellum 2 finely punctured, somewhat less dense than mesoscutum. Propodeum rugose, flatly convex; anterior transverse carina complete or medially, obliterated, the posterior carina medially obsolescent, sublaterally indicated by a crescentic crest. Propodeal spiracle small, shortly elliptic to almost sub-circular. Legs with front coxae and front and middle trochanters marked ivory. Indices of femora: 5.2—5.3 (1); 6.3—7.2 (2); 5.7—6.3 (3), all orange. Tibiae yellowish to brown. Base of hind basitarsus light brown to orange, apex white. Segments 2, 3 and 4 of hind tarsus white, segment 5 brown. Wings hyaline; sides of areola converging (Fig. 4).

Gaster entirely black, with close, adpressed setae. Tergite 2 and following tergites with close, alutaceous microsculpture. In some specimens punctures are visible between the microsculpture of tergite 2.

Material examined. — France: 3 ♂, Cascada, Rosignolet, Mnt Doré (Dép. Puy de Dome), 21.VII.1954, leg. and coll. Betrem; ♂, Clairmarais (Dép. Pas de Calais), 4.VI.1961, leg. and coll. den Hoed. Germany: ♂, Hirsau, VII.1899, leg. Habermehl (SM); ♀, Worms, 24.VI.1896, leg. Habermehl (no 527) (SM). Italy: ♀, Genoa, leg. Spinola, coll. Gravenhorst (ZI) (the holotype of *C. lugubris*).



*Cryptus lugubris atrifemur* (Townes, 1962)

*Trachysphyrus luctuosus atrifemur* Townes, 1962, Bull. U.S. Nat. Mus. 216 (3): 223.

Townes (1962) described a subspecies of *Trachysphyrus luctuosus*, viz. *atrifemur* from Japan. This description closely fits *C. lugubris* and I regard it as a subspecies of the latter. I have studied the type specimen, a ♂ from Mount Norikura, 29.VII.1954, 2400 m, leg. and coll. Townes, Japan.

*Cryptus luctuosus* Cresson, 1864

*Cryptus luctuosus* (= *C. subquadratus* of European authors) is a Holarctic species according to Townes (1962). In letters (10.X.1967 and 4.III.1969) Townes withdrew this standpoint, but I have studied a Nearctic specimen, kindly sent by him, and I adhere to his original opinion. Nor do I think there is reason to transfer this species to the genus *Caenocryptus*, also suggested by Townes.

Key to the subspecies of *Cryptus luctuosus*

1. All femora deep red to rather yellowish red . . . . . 2
- Front and middle femora black to fuscous. Postanellus short and stout, index 3.1. Femora short and stout; indices 3.6 (1) and 4.3 (3) (alpine) . . . . . *C. luctuosus holalpinus*
2. Wings subhyaline (Western Palearctic material) . . . *C. luctuosus subquadratus*
- Wings weakly infusate (Nearctic material) . . . . . *C. luctuosus luctuosus*

*Cryptus luctuosus luctuosus* Cresson, 1864

*Cryptus luctuosus* Cresson, 1864, Proc. Ent. Soc. Philadelphia 3: 290, ♀ (sec. Townes, 1962).

*Agrotherentes (Iiamoplex) ebenus* Viereck, 1917, Bull. Connecticut Geol. Nat. Hist. Sur. 22: 333, ♀ (sec. Townes, 1962).

*Cryptus caligatus* Cushman, 1927, Proc. U.S. Nat. Mus. 72 (art. 13): 2, ♀ (sec. Townes, 1962).

The Nearctic subspecies has been fully described by Townes (1962); according to him it occurs in the northern half of North America.

Material examined. — U.S.A.: ♀, Colorado, Steamboat Springs, 5.VIII.1948, leg. H., M., G. D. and J. Townes (coll. Townes).

*Cryptus luctuosus subquadratus* Thomson, 1873

*Cryptus subquadratus* Thomson, 1873, Opuscula entomologica 5: 478, ♀ (lectotype labelled by Townes; unpublished).

This subspecies is wide-spread in the Palearctic region. It hardly differs from the Nearctic subspecies, perhaps the latter is on the whole somewhat smaller in size.

Description of the female. — Body length 10.0—15.5 mm. Front wing 8.7—11.5 mm. Head black with the following ivory marking: labrum, clypeus, inner and outer orbits. Malar space broad. Clypeus with some coarse punctures. Face of square appearance, with dense sculpture and adpressed grey hairs. Lower frons (the antennal scrobes) concave, polished, with transverse wrinkles. Upper frons rugose. OOL region alutaceous. OOL : diameter lateral ocellus, 4 : 3, 3 : 2, 11 : 8, 10 : 7. OOL definitely wider than lateral

ocellus. Temple and gena broad, polished, coarsely but widely punctured. Antenna of sturdy build, without any trace of a white band (a probably reliable difference from *C. fibulatus*). Index of postanellus, 3.9—4.4.

Thorax black, without a trace of ivory marking. Epomia well-developed. Mesoscutum polished, regularly, somewhat shallowly punctured. Scutellum 2 polished, with widely scattered, fine punctures. Pleural parts and propodeum with close, rugose sculpture. Both transverse carinae present; the posterior with the sublateral corners somewhat raised. Propodeal spiracle subcircular to weakly elliptic, relatively large. Diameter lateral ocellus: diameter propodeal spiracle, 1.0—1.1. Wings subhyaline. Areola in principle "subquadrate", with sides weakly converging and broad anterior side (Fig. 10). Some variation towards a somewhat narrower shape should be allowed for. Legs with all coxae and trochanters fuscous-ferruginous to black. All femora orange, of rather stout appearance. Front and middle tibiae yellowish-orange. Hind tibia and all tarsi fuscous; the latter character suggests "black socks" and also holds good for the Nearctic subspecies.

Gaster black. Tergites with rather fine, alutaceous sculpture. Ovipositor short, 0.20—0.30 length of front wing. The nodus is rather characteristic (Fig. 54).

Description of the male. — Body length 13.9—15.7 mm. Front wing 9.3—11.2 mm. Head black, richly marked with ivory as follows: mandibulae, labrum, clypeus, inner orbits broadly, central convexity towards clypeus, outer orbits and spots in OOL region. Clypeus broad, as in the female. Face closely sculptured. Lower frons concave. Antennal scrobes polished, with some wrinkles. Upper frons rugose. OOL region alutaceous. OOL : diameter lateral ocellus, 13 : 9, 12 : 8, 11 : 8; OOL definitely wider. Antennae long, about length of front wing, tyloidea on segments (16)17—(22)23. In some specimens postanellus with tendency towards rufous. Head with grey pilosity.

Thorax black, only tegulae showing an ivory spot. Sculpture conform to female. Both propodeal carinae regularly developed. Spiracle in most specimens shortly elliptic. Wings hyaline, areola as in Fig. 10. Legs with front coxae and trochanters richly marked with ivory; also middle coxae and trochanters may show marking. All femora bright orange; front and middle tibiae orange-yellowish; hind tibiae and basitarsus fuscous, tarsal segments 2, 3 and 4 of the hind leg whitish. Compare Fig. 50.

Gaster black, tergites with fine, alutaceous sculpture.

Biology. — From the following account it is certain that the Cimbicid *Trichiosoma lucorum* (L.) is the host, at least in the Western Palearctic area.

Material examined. — Germany: ♂, no data, coll. Smits van Burgst (ELW). Netherlands: 4 ♂, Odoorn (Dr.)<sup>1)</sup>, 5.V.1916, ex *Trichiosoma lucorum* (L.), leg. A. J. Polak, coll. Lindemans (MR); ♂, Odoorn (Dr.), 23.VI.1916, ex *Trichiosoma lucorum*, coll. Lindemans (MR); ♂, Odoorn (Dr.), 21—24.V.1899, coll. J. Th. Oudemans (MA); ♂, Schoonoord (Dr.), 19.V.1899, ex *Trichiosoma lucorum*, leg. R. A. Polak, coll. J. Th. Oudemans (MA); ♀, Schoonoord (Dr.), VI.1900, ex *Trichiosoma lucorum*, coll. J. Th. Oudemans (MA); ♀, Drenthe, VI.1915, leg. Smits van Burgst, ex *Trichiosoma lucorum* (cocoon of host on the pin) (ELW); ♂, Putten, 21.IV.1915, ex *Trichiosoma lucorum*, coll. J. Th. Oudemans (MA); ♀, Putten, 17.VI.1919, ex *Trichiosoma lucorum*, coll. J. Th. Oudemans (MA); ♂, Putten, 8.V.1921, ex *Trichiosoma lucorum*, coll. J. Th. Oudemans (MA); ♀, Ermelo, 19.VIII.1917, coll. Lindemans (MR). Sweden: ♀, Skåne, Esperod, leg. et coll. Thomson, no 2/1968 (the lectotype of *C. subquadratus*) (ML).

<sup>1)</sup> Drenthe, a northern province of the Netherlands; the species seems to have been common there at the time.

*Cryptus luctuosus holalpinus* Heinrich, 1951

*Cryptus holalpinus* Heinrich, 1951, Bonner Zool. Beitr. 3—4: 281, ♀ ♂ (sec. Townes, 1962).

A syntype of this remarkable species described by Heinrich was kindly sent to me by Dr. Henry Townes. In 1962, *C. holalpinus* was first interpreted by Townes as agreeing with *Cryptus subquadratus* Thomson; later Townes thought it to be a subspecies of *Caenocryptus luctuosus* (Cresson). I cannot agree with Townes on the generic position of *luctuosus* in *Caenocryptus*, but I do concur with him that Heinrich's material must represent at least a geographically isolated form of *Cryptus luctuosus*. For the present I think it best to treat it as a subspecies of the latter, in anticipation of further material.

A short description of one female syntype follows.

Female, 9.0 mm. Front wing 7.2 mm. Head black, ivory spots on inner and outer orbits. Palpi and labrum black, postanellus short and stout, index 3.1. All following segments of flagellum very short. Antenna without a white band (as in *C. luctuosus*).

Thorax black. Sculpture, propodeal carinae and spiracle (subelliptic) as in *C. luctuosus*. Front femur short and stout, index 3.6. Hind femur stout, index, 4.3. Femora definitely more slender in *C. luctuosus subquadratus*. Both front and middle femora in *C. luctuosus holalpinus* fuscous; hind femora orange.

Gaster black. Ovipositor 0.33 length of front wing. Slightly longer than in *C. luctuosus subquadratus*, but the tip closely resembling that of the latter.

Material examined. — Austria: ♀, Stmk., Kreuzkogel, Südhang, 2000 m, 29.VII.1950, leg. Heinrich (coll. Townes, Ann Arbor) (paratype of *C. holalpinus* Heinrich).

*Cryptus fibulatus* Gravenhorst, 1829

*Cryptus fibulatus* Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 446, ♂ (no 17).

*Cryptus rhenanus* Ulbricht, 1911, Archiv. f. Naturgeschichte 1 (2): 145, ♀ ♂.

The description of this species is based on a single male from Nürnberg (Germany). The specimen is in the collection at Wrocław and is the holotype.

The collection of Ulbricht was lost during the last war (VI.1943). However, syntypes of species described by him are scattered over European collections. In the Lindemans' collection, now in the Natural History Museum at Rotterdam, I found by chance a male and a female of Ulbricht's *C. rhenanus*, both bearing his label and marked "Kotypus". Lindemans was an outstanding Dutch collector of Hymenoptera. He seems to have been in contact with Ulbricht and must have received type material from him. What Ulbricht described as *C. rhenanus* is identical with *C. fibulatus*. This is not surprising as in the last century *C. fibulatus* remained rather obscure. It is a rare species and is undoubtedly difficult to separate from *C. luctuosus* and *C. lugubris*.

Characteristics of the holotype of *Cryptus fibulatus* Gravenhorst. Male, 12.0 mm. Labels: none. Holotype labelled accordingly. Lateral longitudinal carina developed and raised towards the sublateral corners of the posterior carina.

Description of the female<sup>1)</sup>. — Body length, 11.2 mm. Front wing 8.0 mm. Head

<sup>1)</sup> The lectotype of *C. rhenanus* was used for the description.



black. Clypeus broad and rather flat. Facial convexity developed. Face closely sculptured. Antennal scrobes concave, polished, with some wrinkles. Upper frons rugose to alutaceous in OOL region. OOL : diameter lateral ocellus, 10 : 6. Antenna conspicuous: stout, rufous with a broad whitish band on segments 6—12. Index of postanellus, 3.5, short. Temple and gena broad, polished, with rather coarse setiferous punctures.

Thorax black. Mesoscutum polished, regularly punctured. Scutellum 2 rather widely, finely punctured. Epomia present. Notum 1 and episternum 2 with longitudinal wrinkles, rugose. Propodeum roughly sculptured. Anterior transverse carina obsolescent, posterior carina complete, sublaterally somewhat raised. Propodeal spiracle subcircular, relatively large, diameter lateral ocellus: diameter propodeal spiracle, 0.85. Wings slightly infusate, areola with sides converging. Medial vein in the hind wing straight. Legs with all coxae and trochanters ferruginous. All femora orange. Front and middle tibiae and tarsi orange to brownish. Hind tibia and tarsus brown. Indices of femora: 3.3 (1), 3.5 (2), 4.3 (3), all stout.

Gaster black to fuscous-ferruginous. All tergites finely coriaceous. Ovipositor with a strong nodus, 0.28 length of front wing.

Description of the male. — Body length 9.0—12.0 mm. Front wing 7.0—8.5 mm. Head black. Palpi and labrum brown. Clypeus slightly convex, broad, anterior margin flat and straight. Face square in appearance. Facial convexity indicated. Face closely and roughly sculptured, with long adpressed hairs. Lower frons concave, polished and with some wrinkles. Upper frons rugose. Antenna with tyloidea on segments 19—25 (26). Scapi globuliform. The postanellus and one following segment in one specimen reddish brown. Temple and gena polished, with coarse setiferous punctures, separated by somewhat more than their diameter on the gena. Width compound eye: width gena (at base of eye), about 1 : 1. Head with long greyish hairs. OOL : diameter lateral ocellus, 10 : 6; 12 : 8.

Thorax black, tegulae and subalar prominence marked with ivory. Mesoscutum polished, regularly punctured; prescutal sutures well developed. Areola Fig. 6. Scutellum with regularly placed, setiferous punctures. Notum 1 and episternum 2 with coarse longitudinal wrinkles, rugosely sculptured. Propodeum roughly sculptured, anterior carina present or weak, posterior carina developed, crested laterally. Lateral longitudinal carina developed between the anterior margin of propodeum and the sublateral corners of the posterior carina, a very uncommon character in *Cryptus* (Fig. 35). Propodeal spiracle almost round to shortly elliptic.

Gaster black to somewhat ferruginous. Tergites coriaceous.

Characteristics of the lectotype of *Cryptus rhenanus* Ulbricht. This specimen, the only available female, is described above.

Material examined. — Germany: ♂, Nürnberg (the Gravenhorst holotype of *C. fibulatus*) (ZI); ♂, locality illegible, 24.VIII.1880, coll. Dittrich (ZI); ♂, Crefeld Rh, 21.VIII, leg. Ulbricht, coll. Lindemans, paralectotype of *C. rhenanus* (MR); ♀, Crefeld Rh, 21.VIII, leg. Ulbricht, coll. Lindemans, lectotype of *C. rhenanus* (MR); ♀, Crefeld, 21.VIII, leg. Ulbricht; ♀, Crefeld, Ulbricht; ♂, Crefeld, 21.VIII, leg. Ulbricht (all three paralectotypes of *C. rhenanus*, SMF: no H 1630a-c) (SM).

*Cryptus arcticus* Schiødte, 1857

*Cryptus arcticus* Schiødte, 1857, in Rink, Grønland geographisk og statistisk beskrevet 2 (3): 59—62, ♀.

*Cryptus lutescens* Tschek, 1872, Verh. zool.-bot. Ges. Wien 22: 234—235, ♀.

This very remarkable arctic species was first described by Schiødte on material from Greenland. There are 8 syntypes in the Copenhagen Zoological Museum. Up to now no lectotype has been fixed.

A peculiarity is that Tschek (1872) also described this species from one female of unknown locality. For the present I consider it unlikely that this specimen was of European origin, since no other material has ever turned up and we have to bear in mind that the Western Palearctic area has been closely hunted for ichneumon flies ever since Linné. It shall probably remain obscure how the Tschek holotype ended up in the Winthem collection in Vienna. It could have been given to Winthem by Tschek himself.

*C. arcticus* occurs in the Nearctic region, but as Townes remarks "in only a few, widely separated localities". As Townes (1962) has given a description, I shall only give the characteristics of Tschek's specimen, followed by a note on the male. I have inserted this species in my key.

Characteristics of the holotype of *Cryptus lutescens* Tschek. Female, 9.6 mm. Front wing 8.2 mm. Labels: a white tag (printed) "Wthm."; a white tag (Tschek's writing red ink) "Type"; a white label (Tschek's writing) "*Cr. lutescens* Tsch.", *Cryptus lutescens* Tschek ♀ Habermehl det. Holotype labelled accordingly.

Head black, upper outer and inner orbits marked with yellow; mandibels and clypeus somewhat rufous. Malar space exceptionally broad, about  $2 \times$  the width of the mandibular base. Postanellus very slender, index, 7.0. Entire face alutaceous, with punctures between. Frons concave, alutaceous to roughly alutaceous. OOL : diameter lateral ocellus, 11 : 6. OOL wide. Head triangular in the frontal aspect, relatively flat in the antero-posterior line. Head with conspicuous, long, erect reddish hairs.

Thorax black. Epomia lacking. Mesoscutum and scutellum 2 polished between the punctures. Propodeum with both transverse carinae; the horizontal part, with area superomedial, short. Propodeal spiracle subcircular. Wings rather infusate. Areola (Fig. 11). Legs with coxae and trochanters rufous; remaining parts bright orange. Front and middle femora slender; index of hind femur, 6.0. Thorax with erect long reddish hairs.

Gaster with petiole fuscous, other parts bright orange. With fine alutaceous sculpture. Ovipositor 0.36 length of front wing.

Male. — The male closely resembles the female. Head and thorax with very conspicuous long, brownish hairs, reaching the width of OOL. Malar space exceptionally broad, about the length of the fourth antennal segment. Epomia lacking. Propodeal spiracle small, subcircular. Legs orange beyond trochanters. Gaster with petiole fuscous and following parts bright orange. Claspers fuscous. Tergites finely alutaceous.

Material examined. — No locality: ♀, leg. Winthem, coll. Tschek (holotype of *C. lutescens* Tschek) (NMW). Greenland: ♀, Sondrestrom Air Base, 16.VI.1952, leg. W. J. Brown; Børge Petersen det. 1958 (coll. Henry Townes). U.S.A.: ♂, California, White Mtn., Mono Co, 21.VII.1953, 14,000 ft, leg. J. T. Brooks, det. Townes (coll. Henry Townes).

*Cryptus attentorius* (Panzer, 1804)

*Ichneumon attentorius* Panzer, 1804, System. Nomencl.: 158. The description is based on an illustration in: D. J. C. Schaeffer, 1769, Iconum insectorum circa Ratisbonam indigenorum enumeratio systematica 2 (1), Tabula 175, figure 7.

*Cryptus alboannulatus* Szépligeti, 1916, Ann. Mus. Nat. Hung. 14: 246.

Panzer's description reads as follows: "*Ichneumon attentorius* scutello albo; thorace immaculato niger, abdomine coccineo pedibus anticis rufis". The description is based on the above-mentioned illustration in Schaeffer. The illustration must be considered to represent the type. Neither the description nor the illustration are sufficient to recognize the species, but the interpretation of authors goes back to Gravenhorst (1829). The second specimen in the latter's collection represents what we have to take for *C. attentorius* (Panzer) and it is probably best to leave it at that. I have labelled that specimen as follows: "*Cryptus attentorius* (Panzer) 2nd specimen in Gravenhorst's collection" (orange label).

*C. attentorius* is a rare species and it is difficult to obtain material. In all I have seen only five specimens. Nevertheless the species can be easily recognized by some conspicuous characters. It should be said that *C. attentorius* takes an intermediate position between the genus *Cryptus* and *Meringopus*. It has the axillary vein (Fig. 57) in the hind wing diverging from the inner hind margin of the wing (a character of *Meringopus*) but it shows no dorsal tentorial pits. Although I think there is no reason to put this species into *Meringopus*, the diverging axillary vein is a very rare character in *Cryptus*.

Szépligeti does not seem to have known this species, for he described a characteristic specimen as *C. alboannulatus*. A short description of Szépligeti's type specimen is given below.

I have seen only one male, belonging to the Copenhagen Zoological Museum. I failed to make a description of that specimen at the time of my visit, expecting to find more specimens elsewhere. Nevertheless the male is easily recognized if not mistaken for a *Meringopus* species (compare the key).

Description of the female. — Body length 12.7—14.5 mm. Front wing 10.2—11.0 mm long. A large ichneumonid.

Head black, in some specimens a minute yellow spot lateral of antennal socket. Palpi and labrum brown. Clypeus broad and rather flat, with erect hairs. Facial convexity not pronounced; but entire face rather protruding. Face closely sculptured, with adpressed hairs. Entire frons concave; antennal scrobes polished, with transverse wrinkles<sup>1</sup>). Upper frons and OOL region alutaceous, somewhat punctured, the strong rugosity of the upper frons of many *Cryptus* species is absent. OOL : diameter lateral ocellus, 12 : 7. Antenna with short and stout segments, giving the whole a very robust appearance, a white band on segments 8—12. Index of postanellus, 2.7—2.8. Temple and gena polished, with some microsculpture, rather densely punctured.

Thorax black, scutellum 2 with a broad ivory-yellow band. Epomia relatively weak. Mesoscutum polished, densely and finely punctured. Scutellum 2, large, triangular and flat; polished, with some scattered punctures. Episternum 2 not very roughly sculptured, in part polished, with coarse punctures and some longitudinal wrinkles. Propodeum characteristic: both transverse carinae obsolescent, only sublateral corners of posterior

<sup>1</sup>) And no trace of dorsal tentorial pits.



carina indicated by small rounded teeth. Entire propodeum roughly rugose, with longitudinal wrinkles. Propodeal spiracle long elliptic. Wings somewhat infusate. Areola with sides more strongly to weakly converging, rather variable in shape, but mostly with a broad anterior side. Axillary vein in the hind wing strongly diverging from inner posterior margin of wing (an exceptional character in *Cryptus*!) Fig. 57. Legs with exceptionally stout femora; indices: 3.2—3.5 (1); 3.2—4.2 (2); 4.2—4.7 (3) ( $25\times$  magnification). Front and middle femora orange; hind femur, tibiae and basitarsus fuscous-ferruginous.

Gaster with petiole and in most specimens the lateral parts of postpetiole black to fuscous-red. Postpetiole medially and following tergites bright orange. Postpetiole highly polished. Following tergites with very fine microsculpture, but shiny. Ovipositor long, curved, 0.68—0.74 length of front wing.

Characteristics of the holotype of *C. alboannulatus* Szépligeti. Female, 14.5 mm. Front wing 10.8 mm. Labels: a white tag "Hung."; a red tag; a white label with Szépligeti's writing "*Cryptus* (34) *alboannulatus* n.sp."

Head. Index of postanellus, 5.8. Antennal segments short.

Thorax. Shape of scutellum flat, no margin, marked white. Propodeum with only sub-lateral dentation of posterior transverse carina. Index of hind femur, 4.1, short and stout.

Gaster with ovipositor very long, curved, 8.0 mm, 0.74 length of front wing.

Material examined. — Austria: ♀, Piesting, 10.VI.1870, leg. et coll. Tschek (NMW). Germany: ♀, Nürnberg (?), 2nd specimen in Gravenhorst's collection (ZI); ♀, no data, coll. Dittrich (ex. coll. Brade) (ZI). Hungary: ♀, Hung., coll. Szépligeti (holotype of *C. alboannulatus*) (TM). Switzerland: ♂, Sierre, 31.V.1885, coll. Wüstnei (MC).

#### SPECIES INQUIRENDAE

##### *Cryptus macellus* Tschek, 1870

*Cryptus macellus* Tschek, 1870b, Verh. zool.-bot. Ges. Wien 20: 406, ♀ (type lost, nomen dubium).

Habermehl (1930), who looked at the Tschek type material, mentions the holotype of *Cryptus macellus*. According to information received from Dr. Max Fischer the holotype in question is no longer in the Vienna Museum and I consider it to be lost. It has not been possible to identify any specimen with Tschek's description.

##### *Cryptus annulicornis* Lucas, 1849

*Cryptus annulicornis* Lucas, 1849, Exploration scientifique de l'Algérie (Zoologie) 3: 331, ♂ (no 393).

The lectotype of *Cryptus annulicornis* Lucas is a female belonging to the genus *Cryptus*; however the specimen is indeterminable, the greater part of the gaster being eaten away by dermestids. A second specimen, marked "var." by the author, belongs to the genus *Aritranis*.

The name *Cryptus annulicornis* I consider to be a nomen oblitum and I shall inform the International Commission on Zoological Nomenclature thereof.

I have not seen the types of the following species.

*Cryptus armatus* Lucas, 1849, Exploration scientifique de l'Algérie (Zoologie) 3: 330—331, ♂ ♀ (no 392).

*Cryptus turkestanicus* Kriechbaumer, 1882, Termész. Füzetek 6: 150, ♂. The type is lost (Townes, 1965).

*Cryptus heraldicus* Kriechbaumer, 1894, in A. Schletterer; Zur Hymenopterenfauna v. Istrien. Programm Staats-Gymnasium v. Pola 4: 3—36, ♂.

*Cryptus bolivari* Kriechbaumer, 1898, An. Soc. Esp. Hist. Nat. 27 (2): 168, ♀.

*Cryptus kamtschaticus* Habermehl, 1930a, Arkiv f. Zool. 21 A (30): 5, ♂. According to Townes (1965) the type is lost.

#### NOTE ON *Cryptus maurus* TOSQUINET, 1900

*Cryptus maurus* Tosquinet, 1900, Ann. Soc. ent. Belg. 44: 152—154, ♀.

The type material of *C. maurus*, two females, is in the Institut Royal des Sciences Naturelles de Belgique at Brussels. It was sent to me by Mr. Paul Dessart. The two specimens belong to the genus *Meringopus* and are conspecific with *Meringopus nigerrimus nigerrimus* (Fonscolombe, 1850) (sensu van Rossem, 1969). Lectotype and paralectotype hereby designated and labelled accordingly.

#### NOTE ON THE GENUS *Synechocryptus* SCHMIEDEKNECHT, 1904

*Cryptus levaillantii* Lucas, 1849, Expl. Algérie, Zool. 3: 329 (no 390, pl. 18 fig. 10).

*Synechocryptus oraniensis* Schmiedeknecht, 1904, Opuscula Ichneumonologica 6: 427.

In 1904 Schmiedeknecht described a new genus *Synechocryptus* including one species *S. oraniensis*, which is the type-species. Schmiedeknecht's species had already been described earlier by Lucas (1849) as *Cryptus levaillantii* of which the author gave a good description and drawing of the remarkable lobes on the middle tarsus of the female.

In my key I have inserted three other species belonging to the genus *Synechocryptus*: *S. bovei* (Brullé, 1846), comb. nov. *S. mactator* (Tschek, 1870), comb. nov. and *S. crenulatus* (Brauns, 1896), comb. nov. (Fig. 3 and 5).

The Leiden Museum (RMNH) has a female of *S. levaillantii* (Lucas) from Oran (Alger), leg. F. Ancy.

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<sup>1</sup>) The original "Trondhiemske og Norske Videnskabers Selskabs Skrifter" is not present in the Netherlands. The above mentioned translation is the property of Bibliotheek der Teylers Stichting, Haarlem.

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